

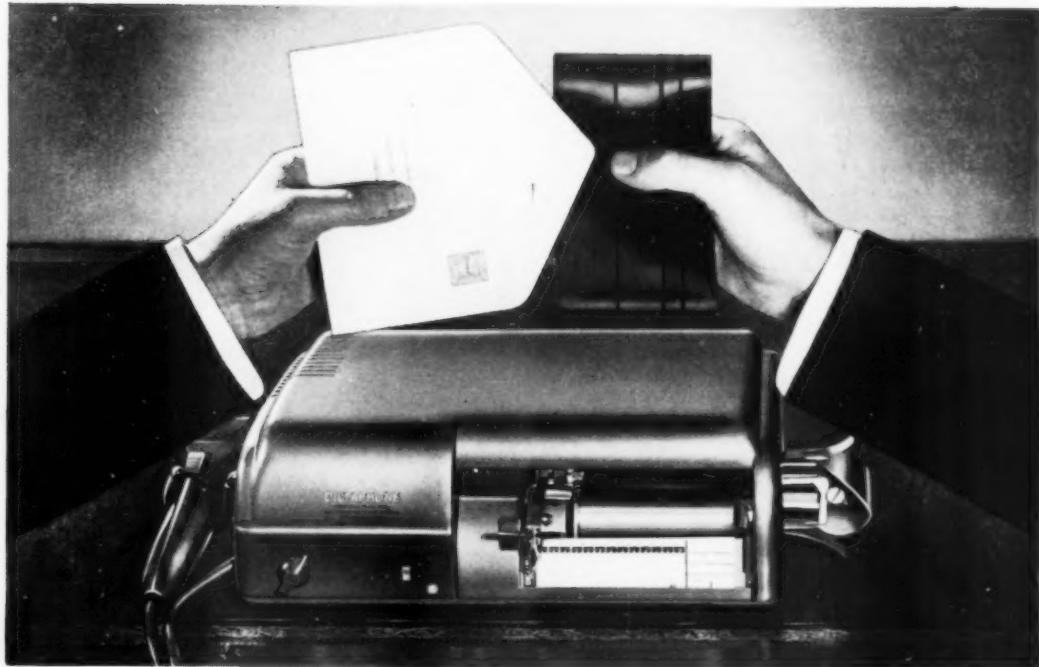
DECEMBER 1951 2/6

BUSINESS

The Journal of Management in Industry



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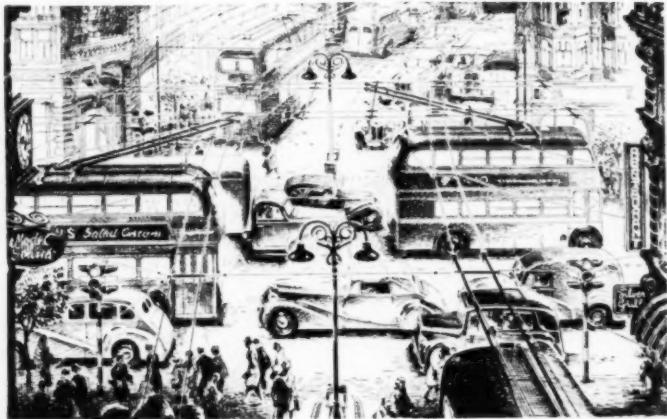
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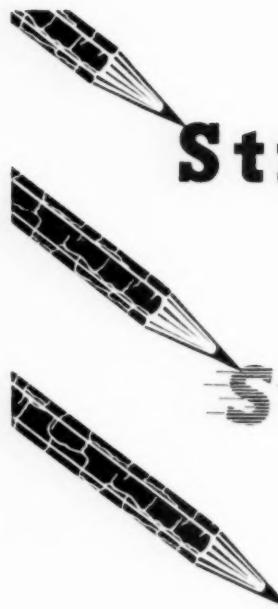
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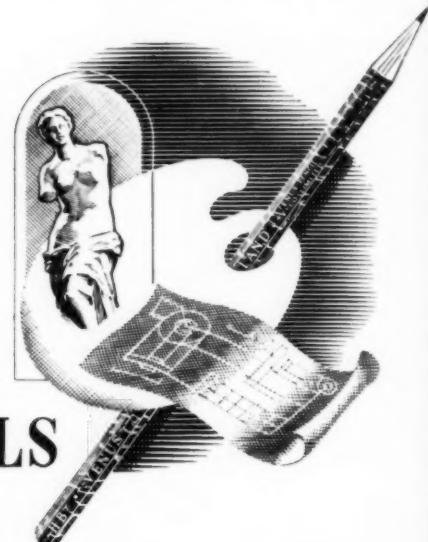
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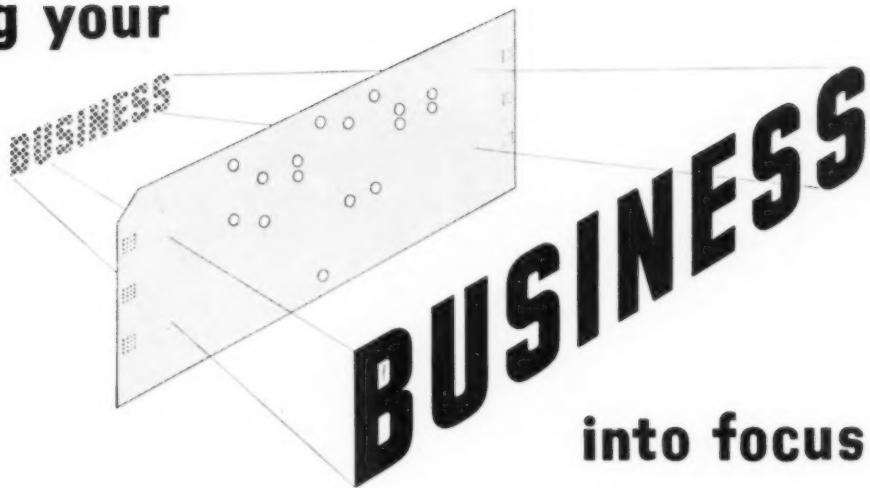
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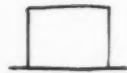
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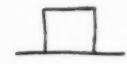
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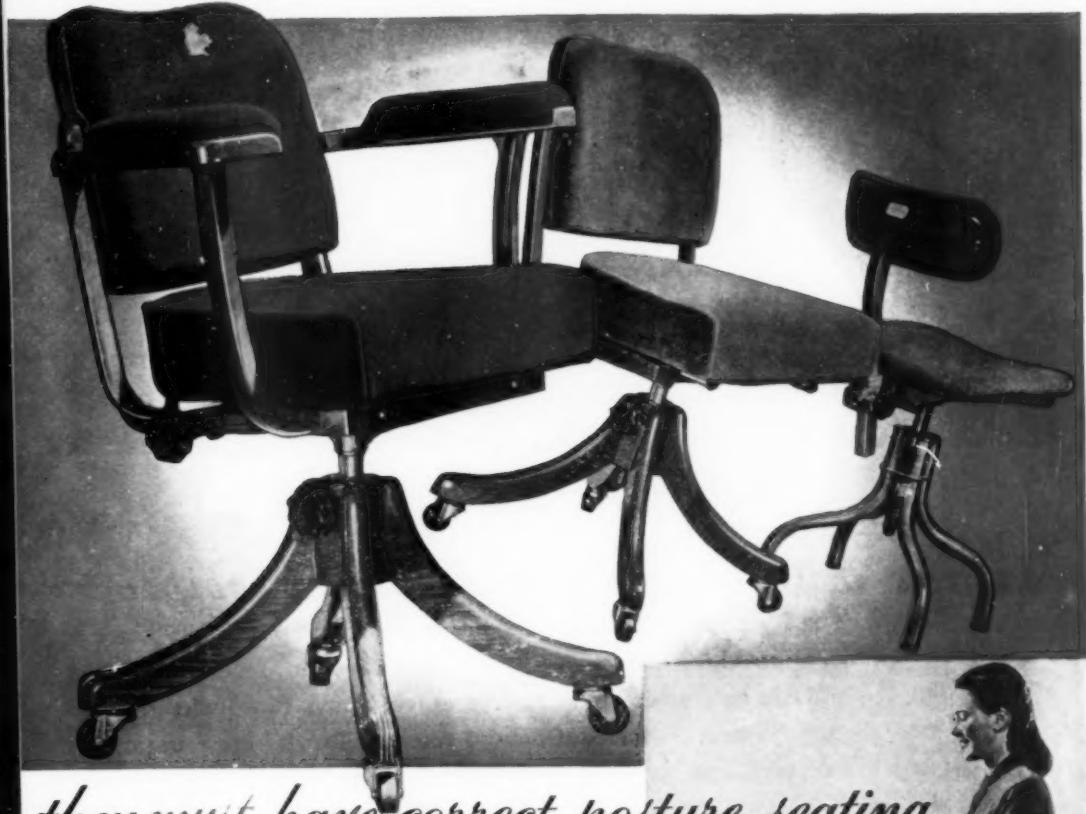


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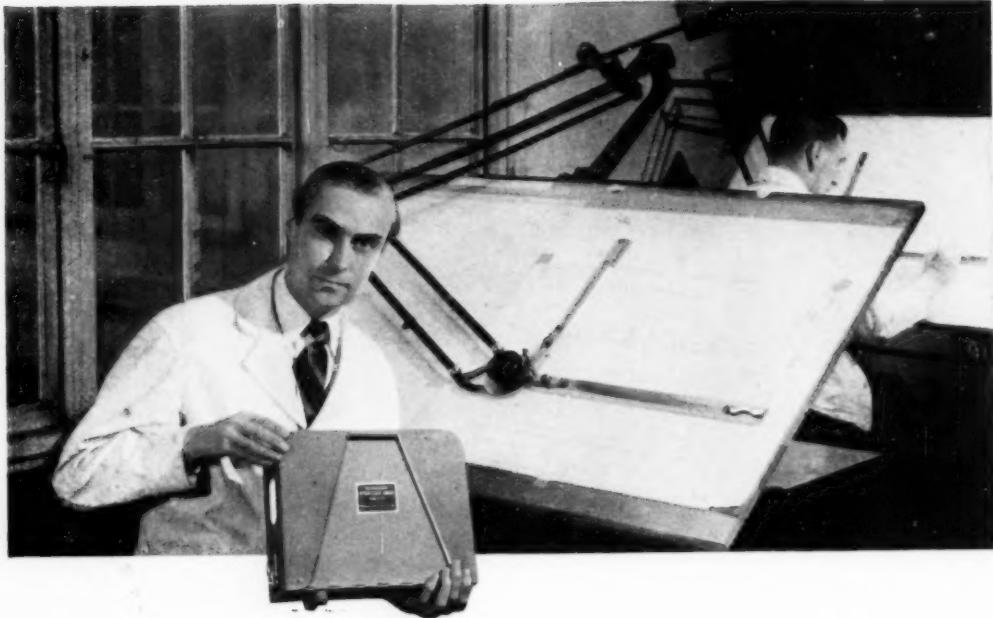
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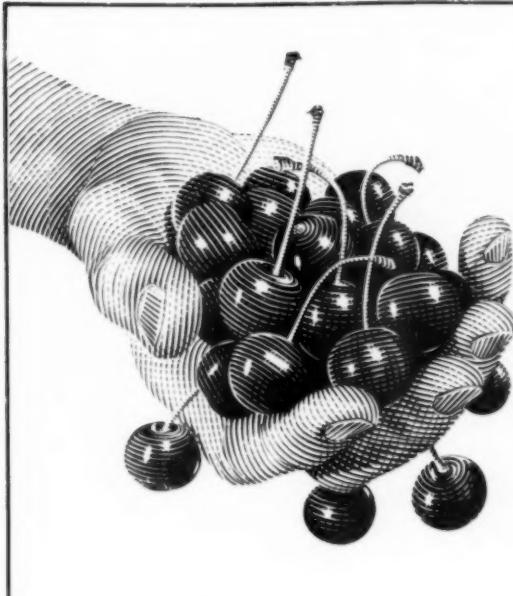
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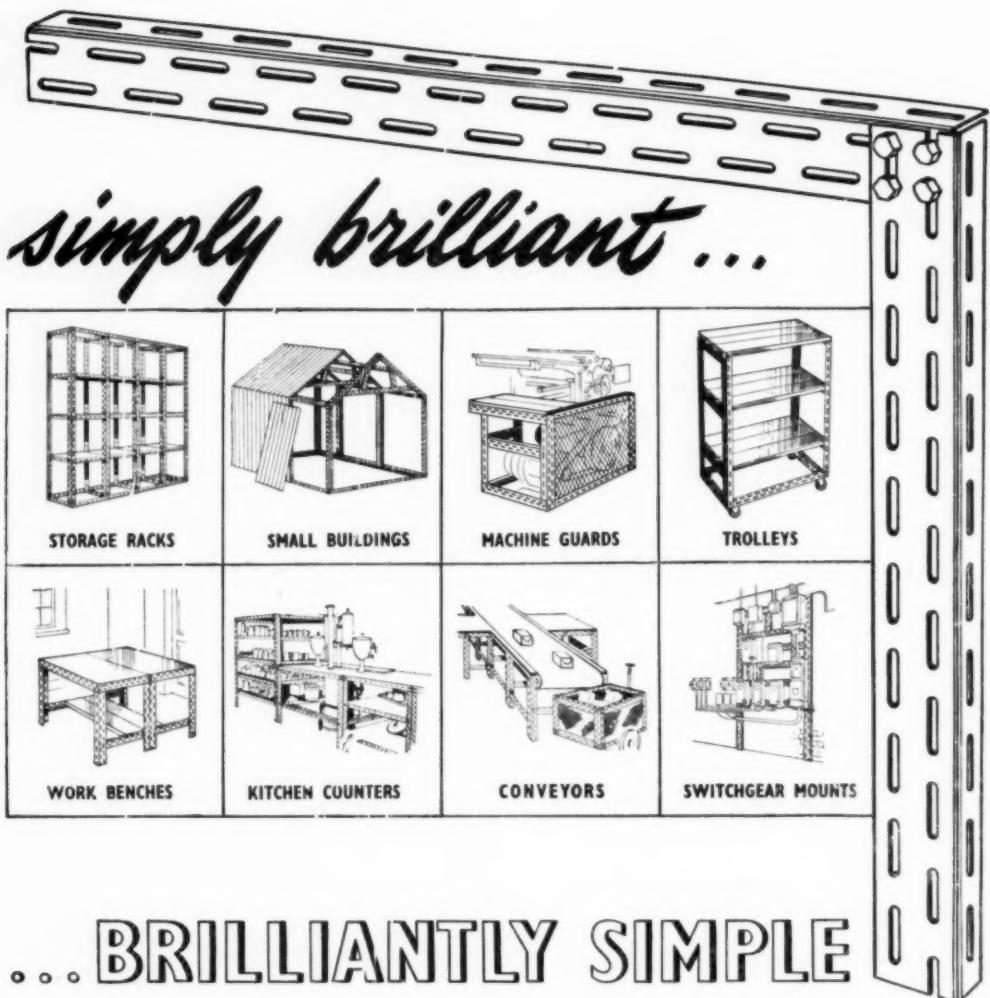


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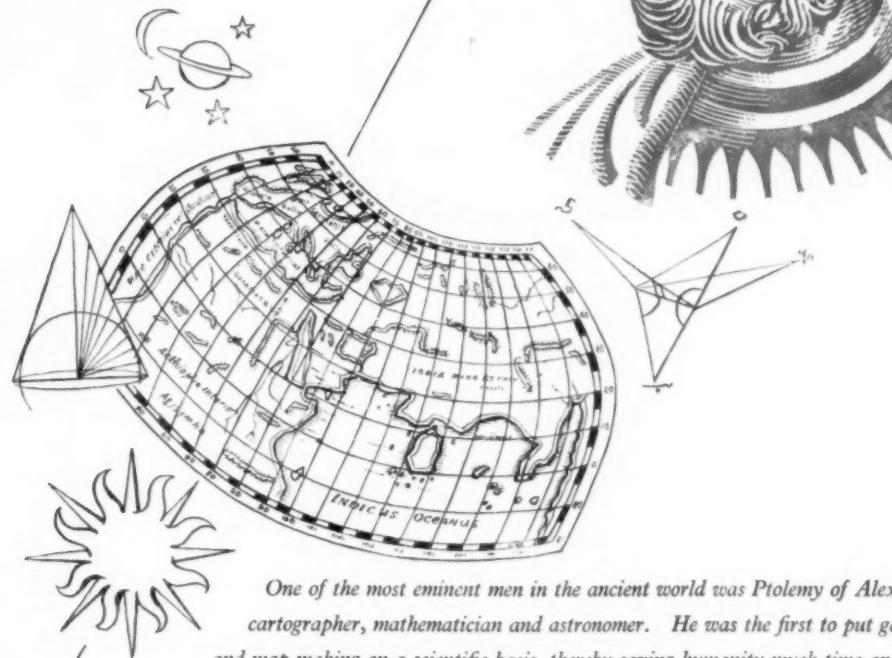
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T.A.3743

Ptolemy the time-saver

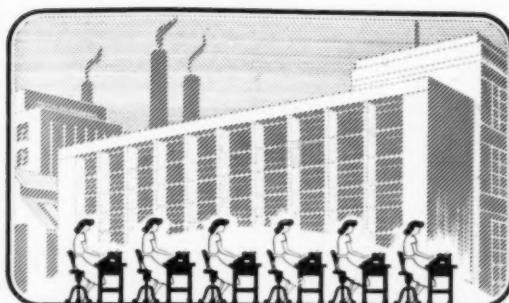
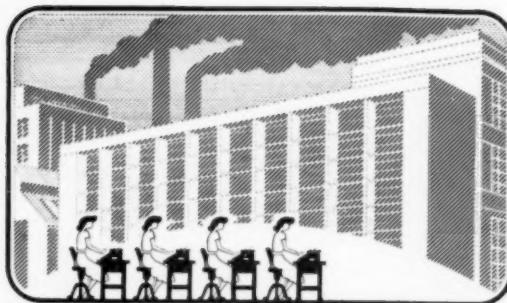


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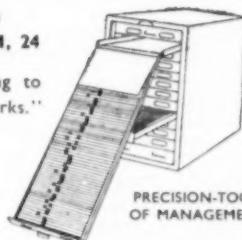
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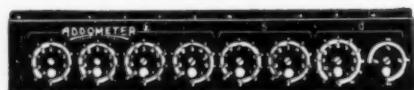
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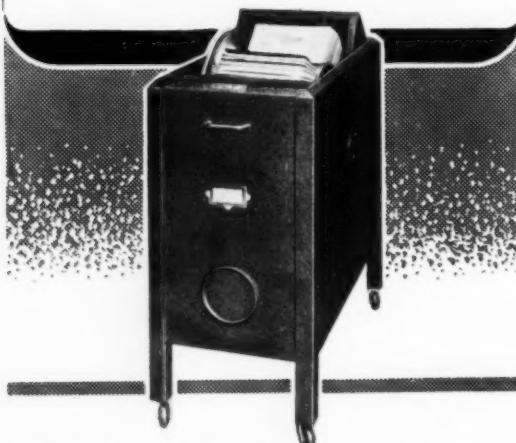
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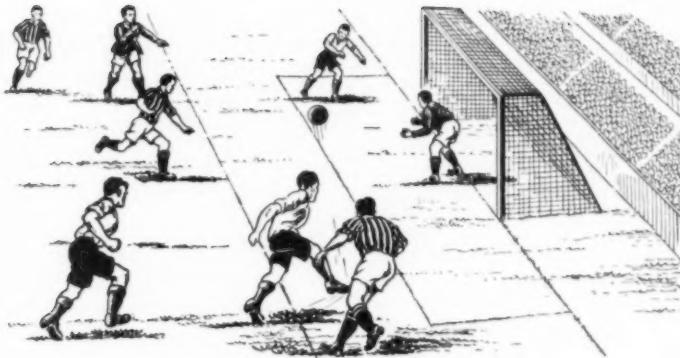
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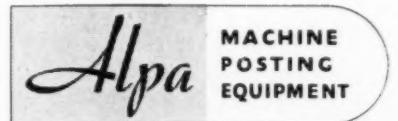
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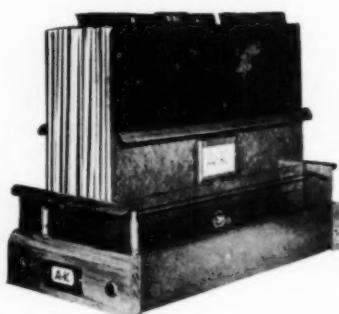
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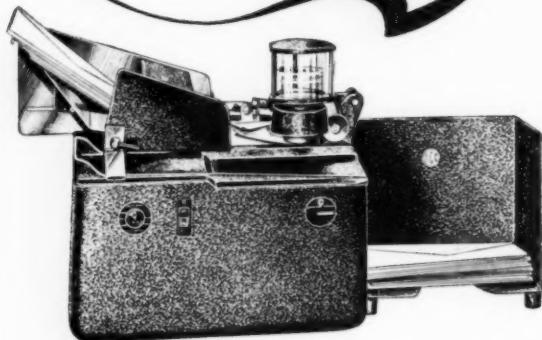
OVERPRINTING MACHINES



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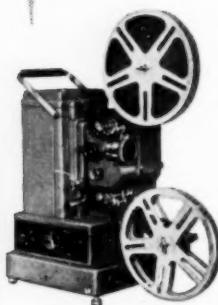
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Made progress slow, his boss irate,
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Orders and carbon copies flow
In continuous length for now they know...

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Are copies, up to five of each.
Bill's happy now, not one mistake.
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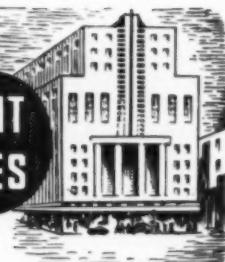
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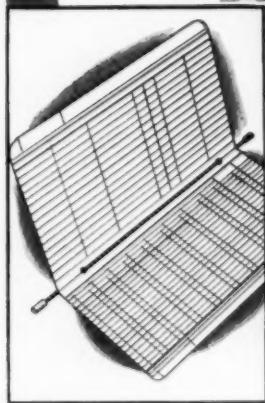
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BUSINESS

The Journal of Management in Industry

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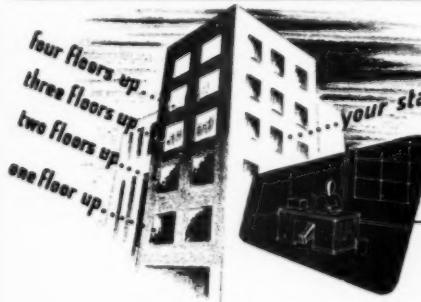
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See business figures as news,

not history



● TO REMEMBER the past is good; to cherish its practices is bad and, in office departments, to put up with annual accounts, when you could have them monthly, or even daily, is to hang on to the past. Yesterday's methods of accounting and calculation mean that vital facts and figures are never available when they're wanted. The result is waste. Waste of staff; waste of time; waste of money.

Burroughs are in business to make figures *news*. They have expert advice to offer on the adoption of an accounting routine that will serve you best. And they can install business machines that solve any figuring problem—faster.

The Burroughs organization is known all over the world. Wide experience of the changing needs of business helps them to solve localized problems *faster*. And to provide an on-call maintenance service that keeps their machines on the job all the time.



IT COSTS YOU NOTHING . . .

Many economies can be made in office departments—but problems cannot be solved until they are clearly defined. The Burroughs publication "Ways to Save Time in an Office" contains useful advice for office management. This booklet can be obtained, free of charge, from Burroughs Adding Machine Ltd., Avon House, Oxford Street, London, W.1.

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The MARCH of BUSINESS

AFTER THE BALL

THE election is over and the Conservatives are back. But there will be few, even among Conservative supporters, who will be very satisfied with the result.

The national economy is in a mess. The nation's productive capacity (as we hope to show in an important article next month) is greater than ever before in its history. But to turn that capacity to use demands hard work, good management and adequate raw materials. Moreover, the goods produced must satisfy a greater demand than ever before. Exports must be increased rapidly and greatly if the dollar gap is to be closed and foreign balances secured with which to buy food and raw materials. And over all hangs the shadow of a rearmament programme whose economic effect has so far barely been felt.

To meet these demands, drastic policies will have to be devised and implemented that will hit the pocket of every man in the country. Their long term effect may well be salutary, but in the short run they will certainly be highly unpopular. And for a government with a majority of under 20, the short run may mean the difference between Westminster and the wilderness.

★ ★ ★

FIRST fruits of the economy drive are the decisions to cancel imports of typewriters and cash registers under open general licence from O.E.E.C. and certain other countries. In recent months, imports of German, Italian, Swedish and Swiss typewriters have been heavy, but these may now be expected to drop off again to nothing.

★ ★ ★

PERIPATETIC PRESS

A PRACTICAL demonstration of the versatility of office duplicating machines and office-type offset litho presses was provided during the recent "Surprise Packet" exercise, when army technicians produced two-page news sheets on a press mounted on an army lorry. Members of the Royal Army Educational Corps and the Army Mobile Printing Platoon, R.A.O.C., produced five news sheets altogether during the exer-

cise, the most ambitious being the *Southland Times*, which was printed photo-litho and ran to six editions.

The paper contained front-line reports of the "fighting" in Midland and Southland, specially drawn maps, current news items, a strip cartoon and photographs. Copy was typed on strips of paper of column width, and special war maps were drawn. These were pasted on to a "make-up" sheet, headings stencilled in and column rules drawn. The sheet was then photographed down to two-thirds of the original size and printed on a metal plate. After being developed, the plate was mounted on to the office-type offset litho press in the army lorry, and the newspaper run off at a rate of 1,500 an hour.

The experiment naturally ran into teething troubles, but the lessons learnt should pave the way for regular photo-litho production on mobile plants, which might well have important civilian as well as military applications.

★ ★ ★

THE 1952 Business Efficiency Exhibition will be held in the Bingley Hall, Birmingham, from February 20 to March 1, 1952. As in previous years, *BUSINESS* will

publish a special Business Efficiency Exhibition issue (this time, the February issue), giving a comprehensive preview of the exhibition, with full details of exhibitors and outstanding exhibits.

First news of the exhibition was given at the annual general meeting of the Office Appliance and Business Equipment Trades Association, the organizing body. The meeting, the first to be held since the merger of the O.A.T.A. and A.B.B.E.M., elected Mr. B. B. Dyer, managing director, Milners Safe Co., Ltd., as president, and Mr. W. J. Arris, managing director of Burroughs Adding Machine, Ltd., as vice-president of the association. At the dinner that followed, an address was given by the guest of honour, Sir William Palmer, K.B.E., independent chairman of the Iron and Steel Consumers' Council.

★ ★ ★

WHAT THE NOVELIST SEES

A FASCINATING thesis could be written (if only we had time) on the varying treatment meted out to businessmen by writers of fiction. Dickens, for instance, took a poor view of the businessmen of his time; Thackeray was more tolerant. In



Mr. B. B. DYER,
Managing director, Milners Safe Co., Ltd. and this year's president, Office Appliance and Business Equipment Trades Association.



Mr. W. J. ARRIS,
Managing director, Burroughs Adding Machine, Ltd., who has taken over from Mr. Dyer the vice-presidency of the Association.

BETTER LIVING- THROUGH INCREASED PRODUCTIVITY



Heinz find that by using Lansing Bagnall trucks they have reduced labour fatigue to a minimum, and are able to manoeuvre pallet loads through all phases with greater ease. This is especially so where room for movement is restricted.

H. J. Heinz Co., Ltd., of Harlesden, one of the largest food manufacturers in this country, are using Lansing Bagnall Pedestrian Controlled Power Pallet trucks to great advantage. The bottles and cans of produce, after being packed into fibre cases, are made into unit loads on pallets at the end of the production line. These loads are then transferred to the warehouse ready for despatch. The loads are taken by Power Pallet trucks to the loading bay, where orders for both small and large consignments are sent to various parts of the country.



The loaded pallet being taken from the labelling and packing line to the warehouse.



The loading bay being "fed" with unit loads by the Lansing Bagnall Pedestrian Controlled Power Pallet truck.

"MECHANISED MUSCLE"



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HAMPSHIRE

BUSINESS

the later Victorian era, the tide ran strongly in favour of the merchant and the industrialist (it was the era of Samuel Smiles and *Self-Help*), though there were noteworthy exceptions such as Samuel Butler and Anstey. The war and post-war era, however, brought a drastic reversal, with the emergence of Upton Sinclair, Clifford Odets and a whole school of "proletarian" authors who pilloried rather than pictured their subjects. That school has disappeared, and today the pendulum has swung back to a more sympathetic approach. The first sign was the British film, *Chance of a Lifetime*, which has since been followed by an American counterpart, *The Whistle at Eaton Falls*. Both dealt with a difficult labour situation in an industrial setting, and held the balance fairly between management and men.

Now comes a novel, *Men at Work* (Michael Joseph, 10s. 6d.), in which the author, Mr. Winston Clewes, depicts, in human terms, the birth and death of an unofficial strike. The firm is a "progressive" one—the managing director is a firm believer in joint consultation and co-operation with the unions. Wages are high, conditions good. There is no real cause for dispute. Yet the men come out, and it is some days before they can be persuaded to return.

"Wild-cat" strikes of this nature are all too common. Mr. Clewes is labour manager of a large concern, and knows his men—at all levels. His analysis is shrewd, and his readers will gain insight as well as entertainment.

★ ★ ★

WITH summer gone, the secretaries of voluntary organizations, from glee clubs to learned societies, gird up their loins. As in previous years, the British Institute of Management has issued a useful little pocket "Management Calendar" (1s. 6d.), listing the meetings and conferences of some 30 management organizations from now until next May. All these organizations, of course, issue their own programmes, but it is useful to have them collated together for easy and constant reference.

★ ★ ★

THE FOREMAN IN INDUSTRY

THE foreman, it is said, holds a key position in industry. Today, when no employer dares to dismiss a worker he cannot replace, good supervision certainly is

SALIENT FIGURES OF THE MONTH

"BUSINESS" INDICES

Latest Month Increase (+) or Decrease (-) on a Month Ago Year Ago

	(1946=100)	*	144.3	+	0.3	+	7.8
Purchasing Power ... do.	110.2	*	110.2	—	0.3	+	2.0

MANPOWER

Total manufacturing industries ... (thousands)	8,725	+	42	+	282
Cotton spinning and weaving do.	332.7	+	1.4	+	2.2
Coal (on colliery books) ... do.	696	—	3	+	4
Reg. unemployed (U.K.) ... do.	240.6	+	12.9	—	67.7

PRODUCTION

Index of production ... (1946=100)	127	—	13	+	4
Coal (average weekly output) ... (thousand tons)	4,437	+	969	+	216
Steel ingots and castings (do.) ... do.	303	+	37	—	23
Cotton yarn (do.) ... (million lb.)	15.91	+	0.04	+	0.34
Woven wool fabrics (do.) ... (million linear yards)	32.40	—	3.33	—	1.23
Passenger cars (do.) ... (thousands)	8.90	—	2.41	—	1.01
Commercial vehicles (do.) ... do.	4.79	+	1.05	—	0.08
Permanent houses completed do.	14.75	—	1.22	—	0.20

TRADE

Value of imports ... (£ millions)	337.4	—	31.1	+	143.5
Value of exports ... do.	207.3	—	18.9	+	35.9
Freight train traffic (million tons)	5.43	+	0.90	+	0.15
Retail sales ... (1947=100)	140	Same	—	—	—

FINANCE

Currency in circulation ... (£m.)	1,309	—	20	+	55
Deposits in London Clearing Banks do.	6,135	+	2	+	107
Provincial cheque clearings (average working day) ... do.	6.97	—	0.10	+	0.54

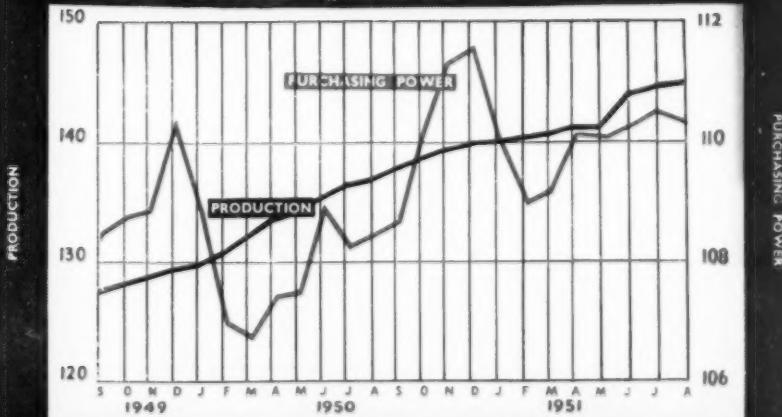
WAGES AND PRICES

Weekly wage rates ... (1947=100)	121	+	1	+	10
Retail prices ... do.	128	+	1	+	14
Raw material prices ... (1949=100)	182.4	+	5.6	+	20.3
Mech. eng. ind. ... do.	142.2	—	0.3	+	22.9
Elec. machinery ... do.	158.9	—	0.4	+	27.4
Building, etc. ... do.	131.5	—	0.2	+	21.3
Import prices ... (1950=100)	138	Same	—	—	36
Export prices ... do.	125	+	1	+	24

*August. †October. ‡Four weeks to September 9th, 1951.

All other items refer to September.

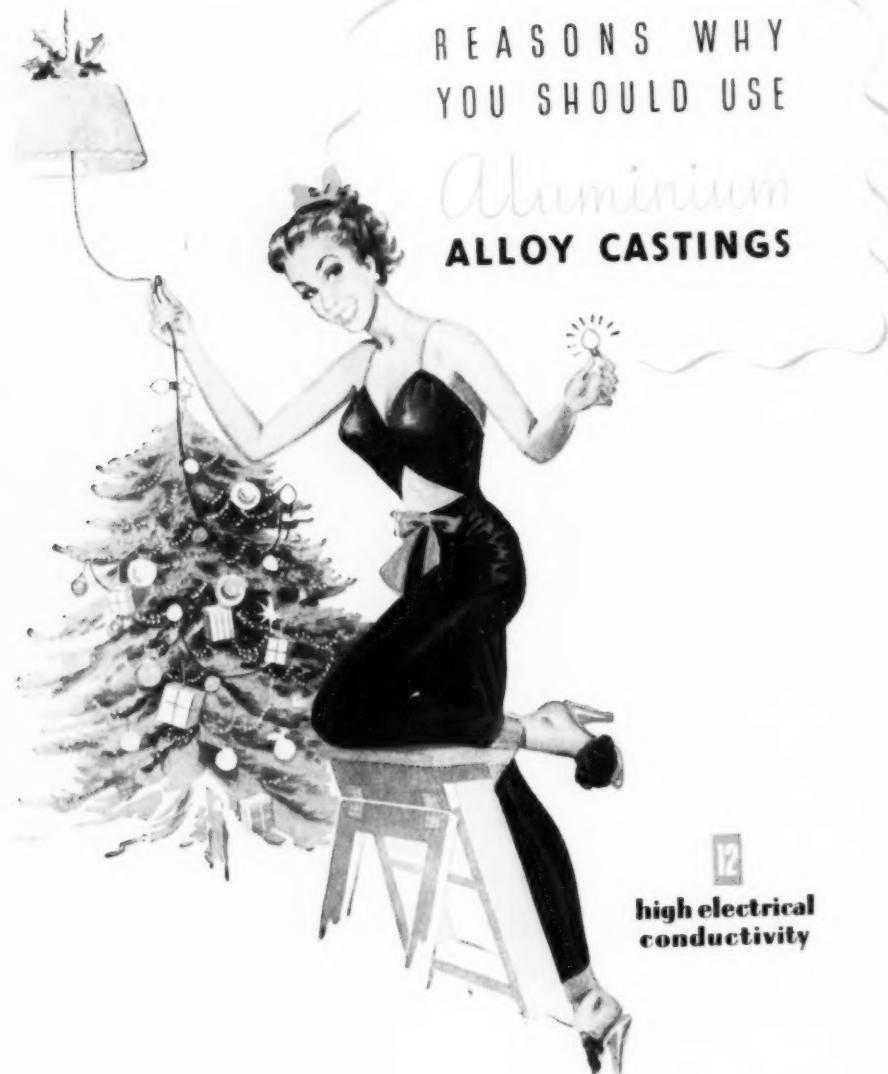
"BUSINESS" INDICES (1946=100)



12

REASONS WHY
YOU SHOULD USE

Aluminium
ALLOY CASTINGS



**high electrical
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BUSINESS

essential. All too often, however, the recognition of the foreman is merely lip service.

Just how weak is this link in British industry is shown by the results of an investigation sponsored by the Human Panel of the Committees on Industrial Productivity and carried out by the National Institute of Industrial Psychology. Foremanship practice in 107 firms was investigated by questionnaire and interview, and the analysis of the results has recently been published as a book, under the title, *The Foreman: A Study of Supervision in British Industry* (Staples, 12s. 6d.).

The figures given are startling. The investigation was dependent on the voluntary co-operation of the firms, so that the sample is probably biased in favour of the more efficient concerns. Yet of these, only 9 per cent. had any systematic method of selecting foremen, with another 19 per cent. still experimenting with such methods. The remaining 72 per cent. were using *ad hoc* methods of appointment.

Training of foremen was in a rudimentary state, though 48 per cent. had used at least one of the three T.W.I. programmes. Of the supervisors interviewed, however, only 11 per cent. had had more than elementary education, and 52 per cent. had had no technical education whatever. Only 40 per cent. claimed to have had any formal supervisory education, however little.

Low status was reflected in earnings. Over 60 per cent. of average grade foremen reported that their best operatives could earn as much or more than themselves in any one week, while 13 per cent. were only earning as much as most of their workers. There were even occasional instances of foremen earning less than the chargehands under them.

The picture is not, of course, without its brighter side. Some firms were using successfully advanced policies in training and selection, and these are described in some detail. There are also valuable guides for the business-

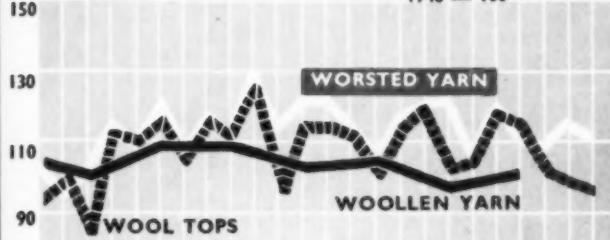
HOW THE CHART IS CALCULATED

The chart shows the monthly output and exports of wool tops, yarn and fabrics, expressed as a percentage of the corresponding monthly average output and exports in 1948.

TRENDS IN WOOL

PRODUCTION I

1948 = 100



PRODUCTION 2

1948 = 100



EXPORTS

1948 = 100



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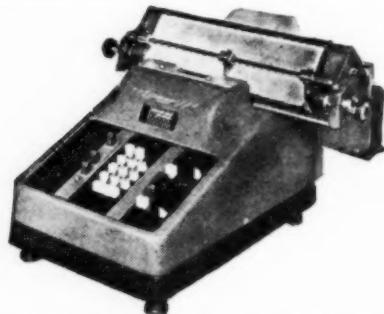
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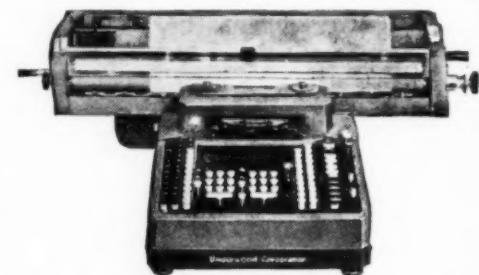
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man, both as to further reading and to sources from which he can get help.

★ ★ ★

AN INTERESTING sidelight from the N.I.I.P. report is the confusion of names in supervision. Over 300 titles were registered of people carrying out supervisory duties. Some of these, of course, stemmed from the technicalities of the trade with which they are associated, e.g., head toolmaker, tenter, etc. Others were more doubtful. Those not familiar with textiles will recognize the overseer, but not the under-overseer, or the under-overlooker. Most of us know the chargehand, but may boggle at the superchargehand.

★ ★ ★

SUPERVISION IN THE U.S.

IN INFORMATIVE contrast to the N.I.I.P. report is the report of a specialist team sent to the United States to investigate supervisory methods there. In the report, *Training for Supervisors* (Anglo-U.S. Council on Productivity, 2s. 6d.), the team report that systematic selection is more widely used than in Britain and that the range and thoroughness of training surpass corresponding activity.

The principles of such training are that it should be done mainly within the firm and that it is the responsibility of all members of the one organization for its application. Training is looked on as a tool of management in the normal operations of the company.

Both individual and group methods of training are used, with conferences, case studies and rôle playing and visual aids being widely used. Training in "human relations" dominated all training schemes.

"It was significant," comments the team, "that in spite of their keen cost-consciousness all the large companies we visited were spending substantial sums of money on supervisory training and obviously believed strongly in its beneficial effect on productive efficiency."

★ ★ ★

THE back-washing machine, shown in the cover photograph, washes and conditions the carded wool sliver before combing. The photograph was taken by Walter Nurnberg, F.I.B.P., F.R.P.S., at the Darlington plant of Patons and Baldwin's, Ltd.

DECEMBER, 1951

Productivity in Cotton Spinning

The Editor, "BUSINESS"

Sir,

THE article, "Lancashire is learning from the Anglo-U.S. Reports," in your last issue is a sincere attempt to sum up the position. Some of the figures given as to productivity in 1937 and 1950 respectively are, however, seriously misleading owing to having been taken from Board of Trade and Ministry of Labour figures, which are official, but which are not comparable owing to a different basis having been used for compiling the figures from 1948 onwards. There is a note to this effect in the Official Digest of Statistics.

Cotton Board Figures

THE figures given in your article show that the labour force in the cotton spinning industry is approximately as high now in 1950 as it was in 1937, and that productivity is 16 per cent. lower than it was then. The correct figures supplied by the impartial and independent Cotton Board Statistical Department show that 140,000 spinning operatives produced 189.2lb. per head in 1937, and that 113,540 operatives produced 178.2lb. per head in 1950. Thus the labour force is 19 per cent. below pre-war level (this being due to the fact that more than half the mills were closed down during the war owing to reduced imports of raw cotton and the labour forces were dispersed), and the production per head of its workers is about 6 per cent. lower than in 1937. Taking production per head per hour, however, as is surely correct when comparing productivity, the productivity of Lancashire spinning operatives is as high in 1950 as in 1937, the drop of 6 per cent. being due to the reduction of working hours from 48 hours to 45 hours per week. Similar corrections apply to the figures given in your article for the cotton weaving industry.

The above is based on the true official figures. In addition, it is only fair to managements and operatives to mention the following adverse factors, but for which the productivity figures would be higher than pre-war:—

- (1) the official figures of operatives for 1950 include several thousand more winders than pre-war. Winding is an additional process which improves the yarn preparatory to weaving but does not increase the total production.
- (2) the official figures for operatives include an increased number of non-productive workers of clerical, administrative and welfare grades caused partly by the need to comply with various Government orders and partly by increased social awareness.
- (3) inferior quality of raw cotton and need for frequent changes from one variety to another owing to non-availability of sufficient dollar-cotton from America.
- (4) disturbance in production flow owing to shortage of labour and non-availability of reserves to cope with sickness or absence.

Additional Factors

THE loss in overall productivity caused by the first two factors can be calculated approximately and amounts to not less than 3 per cent. and possibly over 5 per cent. The loss due to the latter two factors can only be guessed at, and one would not wish to add guesses to what is a purely factual letter. It is clear, however, that the production per hour per head of the operatives working on the machines is higher than pre-war and that overall productivity is at least as high.

Finally, we are prepared to agree that the present productivity should increase until it becomes more comparable with that of cotton mills in the U.S.A. We are hopeful that it will do so because the figures show a steady increase each year from 1945, and the productivity reports will assuredly help to speed up the tempo of improvement.

I am, Sir,

Your obedient servant,
C. Henniker-Heaton,
Director.

Federation of Master Cotton
Spinners' Associations, Ltd.,
Manchester, 2.



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The worker of today looks ahead, and his future prospects concern him just as much as next week's pay packet. Modern managements realise this hence the rapid increase in the number of firms running pension schemes for their employees. Here is an important policy article describing what pension schemes can offer the progressive businessman, and how he can get the most out of them.

Pensions Are Also An Incentive

By The EDITOR

INCENTIVES to higher production are normally associated with immediate money rewards geared to output. There is no doubt that such payments are strong incentives. But they are by no means the only ones; as has been repeatedly stressed in these columns, incentives are a complicated nexus of different and often competing factors.

The worker is certainly concerned about the size of his weekly pay packet. But he is also equally concerned about the conditions under which he has to do his job, the relationships between himself and his supervisors and management, the prospects of promotion in his firm, and the security of tenure he obtains. To-

day, when opportunities for high earnings are common, it is these factors that mean the difference between a stable, expert, hard-working team of workers and a labour force ridden by high turnover and low morale.

The demand for security—whatever we may think of it on ethical grounds—is a symptom of our time that no businessman can ignore. Its implications for industry can be measured by the fantastic growth in the number of pension schemes run by companies.

The development is comparatively recent and statistical data is scarce. A Ministry of Labour survey showed that in 1936 some 6,500 employers (excluding

Government departments and local authorities) had established employees' pension schemes. These were divided equally between private schemes and schemes operated through a life insurance office; the private schemes covered 1,362,000 employees, and the life office schemes only 255,000 employees.

Since that date, and particularly since the war, the number of schemes operated through life offices has grown rapidly. Figures recently issued by the Life Offices' Association and the Associated Scottish Life Offices show that in 1949 the schemes for which member firms were responsible covered about 1,000,000 workers, who, when they retire, will be en-



7 Types of Pension Scheme

1. DEFERRED ANNUITY

Payments are made during the term of employment by employer and employee. On retirement, the employee receives a fixed monthly pension until his death. If he dies before reaching retirement age, his contributions are returned to his estate.

2. ENDOWMENT ASSURANCE

Payments are made during the term of employment by employer and employee. On retirement, the employee receives a lump sum.

3. GROUP ENDOWMENT ASSURANCE

Benefits consist of an annuity (pension), or a payment approximately equal to one year's salary on premature death.

4. GROUP FAMILY INCOME BENEFITS

The pension is paid to the employee and to his widow, if he dies first, until her death.

5. GROUP ENDOWMENT INSTALMENT ASSURANCE

The scheme is based on an endowment assurance, but benefits are paid monthly to the estate of a deceased employee from the date of his death to the date at which he would have retired.

6. TOP-HAT SCHEMES

Supplementary schemes under which in return for tax-free contributions paid by the employer, the employee receives a lump sum on retirement.

7. WITH PROFITS BASIS

Benefits are increased by bonuses paid by the assurance company from its profits.

tituled to pensions totalling over £100,000,000 a year. The rapidity of progress may be gauged from the fact that the premiums payable in 1949 on all policies then in effect amounted to £50,000,000, while those payable on new policies taken out in that year alone amounted to £8,000,000. No figures are available concerning private pension schemes, but it is considered that these have increased at a much slower rate, so that the balance between private and life office schemes is today much more equal than in 1936. The Association of Superannuation and Pension Funds estimates that there are at present about 8,000 pension schemes of all types in existence, with a total of 2,500,000 members.

Better Workers ?

A high proportion of these premiums is being paid out by hard-headed businessmen, who expect a solid return for their money. What do they get? The most obvious answer, intangible though it may be, is improved morale. Labour today demands security, and in so far as that demand is met, is more contented. But there is more to it than that. The quality of labour is improved. Other things being equal, those responsible for youngsters starting work will recommend them to firms that can offer prospects of rapid promotion and long-term security. This means that the firm offering such benefits will be in a position to pick and choose new entrants, and can insist on standards of quality that another firm, struggling to maintain its labour force, cannot do. Labour turnover, moreover, tends to be lower in firms that operate a pension scheme. The loss of pension rights acts as a deterrent to the continual switching of jobs to obtain an immediate cash benefit.

Perhaps the greatest advantage gained from pension schemes, by employer and employee alike, arises from the exemptions from tax that can be obtained. High taxation is one of the greatest drags on incentive to-day. Even at shop-floor level, the inroads made by P.A.Y.E. on piecework earnings and output bonuses is serious enough; the problem of offering a significant financial incentive to a senior executive who

is already paying sur-tax on a basic salary is well-nigh insoluble. In both cases, however, a pension scheme offers an answer. Payments of premium, both by employer and employee, are free of profits and income tax. When the policy matures, income tax must be paid on the pension, but if a lump sum is taken in partial lieu, tax is chargeable at a reduced rate. In any case, the amount of tax payable is likely to be smaller than if an increase was made in current earnings.

The only disadvantages of running a pension scheme are its cost and the risk and labour attached to starting and maintaining it. The question of cost is, of course, comparative, and every businessman must decide for himself whether the benefits to be had justify the expense of obtaining them. Just how much is involved financially will vary according to the type of scheme and the benefits to be received, but a leading actuary recently suggested that the gross cost incurred is of the order of £10 10s. a year (where retirement age is 60), or £15 a year (where retirement age is 65), for every £100 a year to be paid out in pension per worker. In a contributory scheme, of course, a considerable proportion of this would be paid by the employee himself, and the net cost to the employer would be correspondingly less.

Pension Preferences

Originally, pension schemes were usually non-contributory. Today they are usually contributory. Employers prefer this for obvious reasons. So do employees, since under such schemes they have a legally enforceable right to their pensions and, through joint management boards, some control over them. Originally, too, most schemes calculated the benefits payable on the "last salary" basis, i.e., the pensioner received a weekly or monthly sum proportional to the salary he was receiving at the end of each year of his employment. This system has the advantage of simplicity, but means that the level of pensions is affected by changes in general salary levels. The amount of the pension received by a man retiring this year after 44 years' pensionable service, for instance, will be

Continued on page 88

Private or Life Office Schemes

Should a pension scheme be run by firms themselves, or should they get an assurance company to do it for them? Here are the pros and cons:-

- 1. Risks must be spread widely. Only a large firm can do this. The assurance company can do it even better.**
- 2. Pension funds must be accurately worked out and investments skilfully administered. Only a fairly large firm can afford to employ the necessary experts. The assurance company has the experts and carries all risks.**
- 3. With a privately administered fund expenses can be kept to a minimum, and surpluses can be ploughed back into reserves or additional profit. The assurance company naturally expects to make a reasonable profit on its business.**
- 4. The privately administered scheme can be modified or discontinued if future developments demand it. Once a contract is made with an assurance company, it becomes wasteful to cut loose from it, and no alteration can be made without the consent of the company.**
- 5. The assurance company will retain the right to alter its tariff for future entrants, and the employer will have no option but to accept any such alteration. No reputable company would, however, suggest any alteration lightly or without full consultation.**

How Motion Study Boosted Productivity by 25 per cent

By PHILIP F. DYER

Output has been increased in woollen and worsted spinning mills in Bradford by 5 and 25 per cent. respectively by the application of motion study. The increase—the result of a two-year pilot experiment—was obtained without additional labour and with only a small investment in new plant.

IN the struggle for higher productivity, much less has been heard about progress made in the wool textile industry than in its younger sister, the cotton industry. That the woollen industry has not been quiescent is shown in two reports recently made concerning reorganizations carried out in two Yorkshire mills.

In the summer of 1947 a joint advisory committee on production was set up by the employers and trade unions in the wool industry, and in 1949 it initiated two pilot experiments in the use of motion study in the woollen and worsted yarn spinning sections of the industry. These experiments, carried out by the Anne Shaw Organization, have now shown highly successful results, with increases in productivity of about 26 per cent. in worsted and 6 per cent. in woollen spinning. These increases have been achieved with a reduction in the labour force and without any large-scale capital investment. The only expenditure involved has been on the moving of machinery and on the provision of attachments to machines and

handling and other ancillary equipment.

The two mills concerned were chosen by the consultants from a number of volunteers, because they were already considered efficient, and were representative of the whole industry. The woollen mill was operated by Messrs. James Watkinson and Son, Ltd., at Holmfirth, and the worsted mill by Messrs. W. and J. Whitehead (Laisterdyke), Ltd., Bradford. The consultants started work at Whitehead's in August and at Watkinson's in September, 1949. The employers' council, the trade unions and the research association appointed liaison officers at each mill, who co-operated with the consultant throughout the experiments. An initial meeting was called at each mill by the manage-

ments concerned, who explained in detail what was planned, and introduced the liaison officers. After answering questions, the management asked for, and obtained, the workers' co-operation in the experiment.

It is significant that in the two years during which the experiments have been running, there has not been a single stoppage or dispute at either mill.

The work of investigation developed in three stages:—

Stage 1. A record was made of each successive step in the manufacturing process. This included the study of an operative's work around the machine, the operative's performance, the machine performance, material requirements, ancillary duties and equipment, the suitability of plant lay-

THE OLD. Congested machinery meant that alley-ways were blocked with bobbins awaiting loading or clearance. Loading involved much carrying and lifting.

THE NEW. Improved layout has meant that bobbins can be carried direct to the machine face. Platforms cut out much stretching by the operator.





THE OLD. Heavy bobbins were moved from one machine to the next by rolling and carrying them by hand. Machines had to be stopped for loading and unloading.

THE NEW. A simple reversible stand enables the operator to unload the bobbins from one machine and load them on to the next without loss of machine time.

7ins. to 5ft. 2ins. This, together with the reduction in the number of journeys brought about by the provision of the metal containers, cut considerably the amount of walking that had to be done by the chargehand, while the provision of the platform eliminated much stooping, reaching and lifting. The job was cleaner, since material was not dropped on the floor, and sweeping and sorting were practically eliminated. The amount of floor space used in the operation was also substantially reduced.

Changes in lay-out also played a great part in the reorganization of one of the two carding and spinning departments at Holmfirth. This was sited on the third and fourth floors of an old building. In this section the raw wool from the teasing department was worked up by carding machines, and then by spinning mules or frames into finished yarn.

Space Restricted

Each floor had one or more of each type of machine and operated as a self-contained unit. Material came from the teasing department in the form of sheets, and was temporarily stored in hoppers adjacent to the carding machines. Space was very restricted, however, and only minimum requirements could be handled; alleyways between the machines were narrow, and were further restricted by the piles of empty bobbins at the ends of all the mules and frames. Even under existing conditions the arrangement was unsatisfactory, and a proposed re-allocation of duties between operatives on the machines would have made it unworkable.

The storage problem was solved by the construction of special bins fed by pneumatic tubes—a change already in process before the consultant came into the picture. To improve the work flow, all the carding machines were concen-

out and work area, and the study of the flow of material through the different processes. In some cases films were taken of an operation to discover unproductive or awkward movements.

Stage 2. A detailed analysis was made of these records.

Stage 3. New methods were developed in the light of lessons learned from the previous stages.

The whole investigation was carried out in terms of motion study. Time study was used only, incidentally, to determine the relative proportions of the working day spent by an operative in various tasks, and to assess the relative efficiencies of various methods of doing a particular job. No attempt was made to set standard times for various operations or, of course, to relate earnings to any such times. The reorganization did involve an adjustment of the piece-rates as a result of the new methods of work introduced, but these were thrashed out between the employers and the unions on a normal collective bargaining basis without the intervention of the consultant.

The term "motion study" is normally identified by the uninitiated with the study of the movements made by a worker on a job. It is, however, larger than this; it includes the movement of materials as well as of men. Thus it brings in questions of factory lay-out and handling, and it is not surprising that a major part of the reorganization at the two mills has been concerned with the rearrangements of machinery and plant.

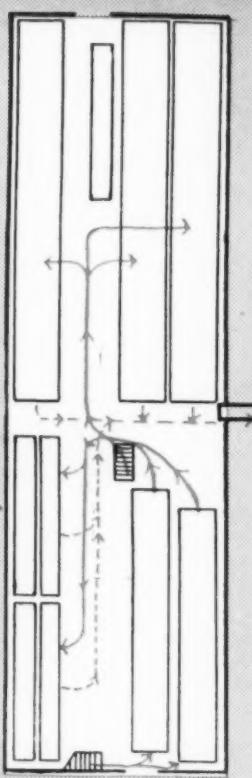
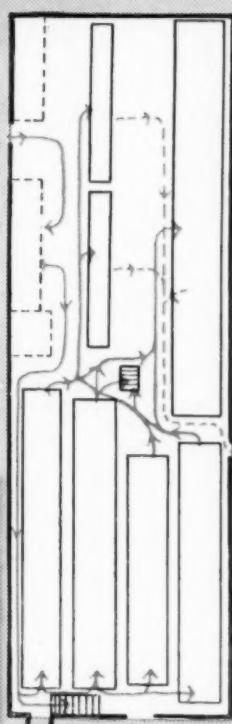
The simplest case was in the teasing department at Holmfirth. Here blends of 2,100lb. of raw wool were made up by a chargehand from anything up to half a dozen different bales or sheets of different qualities. These bales were scattered over the floor, and the chargehand had to walk to each to get the quantity necessary to make up a 100lb. batch in the weigh-pan. If he misjudged the quantity, he had to return to the bale in order to get more material or dispose of the surplus; often small quantities of surplus material were merely dropped on the floor to be swept up and sorted later. When the batch was correctly made up, it was tipped into the feed hopper behind the weigh-pan, from which it was carried to the machines by pneumatic tube.

To make the job quicker and easier, a semi-circular platform, inclined to the centre, was built around the weigh-pan. The bales were loaded on this platform by an electric hoist running on a monorail round the perimeter of the platform. A series of shallow metal containers was also installed as near to the weigh-pan as possible to hold small quantities of surplus material after any particular weigh, and to act as a reservoir from which subsequent weighs could be made up without the need for a further journey to the original container for small amounts.

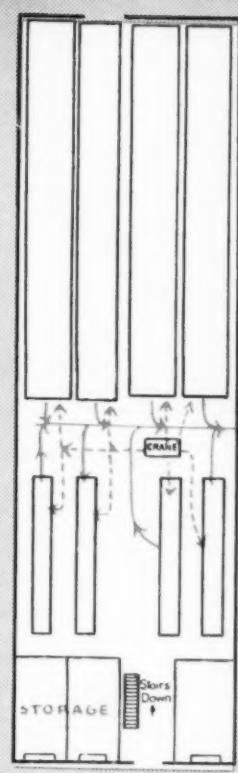
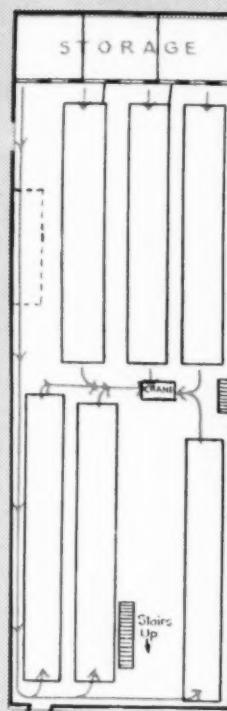
By this means the average distance between weigh-pan and material was reduced from 9ft.

These New Layouts Boosted Output

OLD

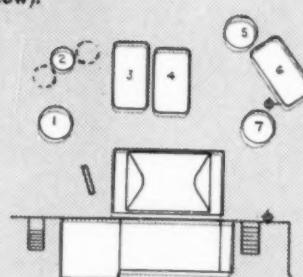
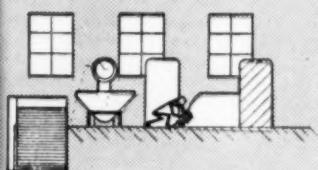


NEW

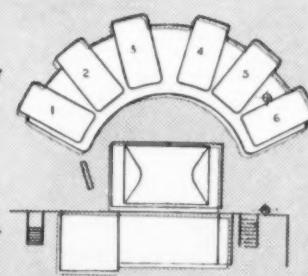
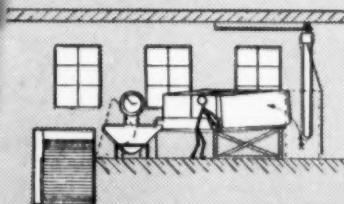


Wool carding and spinning (above),
and teasing (below).

OLD

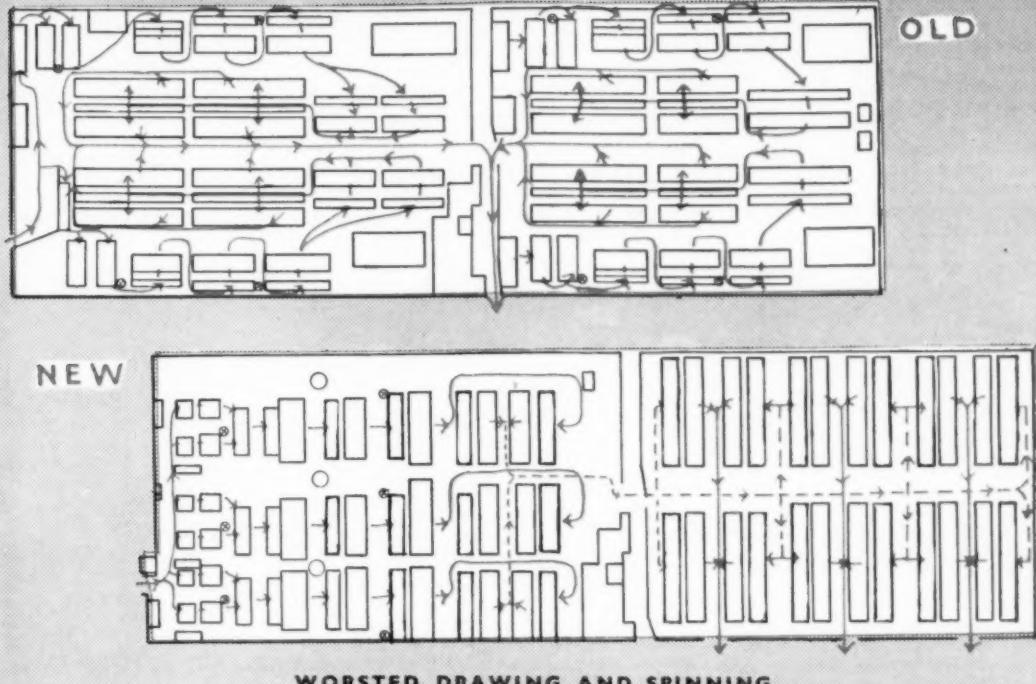


NEW



trated on the third floor, with the discharging ends towards the centre of the room, and all the spinning machines segregated on the fourth floor. The stairs in the centre of the room were replaced by an electric hoist that transported on mobile carts, the bobbins from the condenser (or delivery) end of the carding machine to the floor above, and returned the empty bobbins. A static storage rack, ten tiers high, was erected close to the condenser to hold these empty bobbins, so saving floor space.

A similar reorganization of layout was carried out in the drawing department at Whitehead's. This consisted of four sets of machinery, operating in the same room as separate units, on the ground floor. This lay-out meant that the placing and moving of cans (holding material in process) and bobbins was difficult and exces-



sive. Narrow gangways meant that moving had to be done by hand.

After the preliminary study, complete reorganization of lay-out and working methods was carried out, which ultimately allowed three sets of machines to produce more than the original four, with fewer workers. The three sets have been laid out so as to allow a straight production flow, and are identified by colour, with trucks and bobbins bearing similar colours for rapid tracing of faults. A hoist has been installed at one end to supply raw materials from the cellar to the first machines in the process. This has simplified the trucking arrangements previously required to provide materials from the centre hoist to the storage bins at the opposite ends of the room.

The handling operations involved in worsted spinning consist

essentially in taking off ("doffing") full bobbins from the delivery end of one machine and loading ("creeling") them on to the receiving end of the next. This handling occupied anything from 19 to 65 per cent. of the operator's time, according to the actual machine concerned. During this time the machine stood idle, so that production was lost.

Much time was consumed because of the design of the "creel" itself, and a new creel was designed to facilitate loading and unloading. Instead of the traditional vertical frame, into which the bobbins had to be loaded so that both ends fitted into slots, a stand was devised in which the axles on which the bobbins revolve are inclined at a slight angle to the horizontal. All the operative had to do was to slip the bobbin on and gravity did the rest; bobbin removal is equally simple. The new

creel, moreover, carries twice as many bobbins as the old and is fitted on a turntable, so that one side can be creeled while the bobbins on the other side are being fed into the machine. In some cases it has been possible with the new lay-out, to unload full bobbins from one machine directly on to the creel of the next machine without any transport; in other cases trucks have been provided to obviate manual handling.

Some modifications were also made to machinery to speed and ease the handling of the bobbins. On one machine, for instance, it was found that by lowering the platform on which the bobbins rested, so that they could be slid off instead of lifted off, the actual operations in doffing could be reduced by 25 per cent.

Even where manual handling has had to be retained, it has been made easier. In the first process,

for instance, the sliver of wool was delivered into a can that weighs 49lb. full and 19lb. empty. The full cans required a double lift to clear a ridge along the end of the platform of the machine. The platforms have been modified so that the cans can be slid off, and ball castors fitted to the cans correspond with small holes in the platform, ensuring easy and rapid replacement.

The handling of the bobbins throughout the process has thus been reduced to a minimum. The consultant has calculated that distances travelled by operatives have been reduced by anything from 8 to 9 per cent. according to the machine manned.

No Stretching

In woollen spinning the position is not so acute, since doffing and creeling cards, mules and frames take up a smaller proportion of the operative's time. No major change could be made, but an improvement was carried out by the provision of a platform in front of frames to stop the operative having to stretch up when loading, and the provision of a mobile cart running along the front of a frame, with a basket into which full bobbins could be doffed, and a box containing the empty bobbins to replace them.

The basic idea of motion study—the analysis of movements of hand, arm and body by an operative during a particular job—was not neglected. A new method of work was introduced in piecing and twisting ("operatives should use both hands, setting in two

spinning bobbins simultaneously, and threading the ends through in a single operation").

Even when every possible improvement had been made by improved lay-out and better handling in the way that jobs were carried out, however, there still remained a fundamental unbalance between the work done by various classes of operator, so that some were enforcedly idle, while others were overworked. The position came out most clearly in the woollen carding process. Here the machines were operated by "minders," whose job it was to load and unload the machines, to supervise their operation, and to clean and oil them. Periodically, the machines have to be "fettled," i.e., the major cleaning of parts of the machine that cannot be reached while it is operating, maintenance and replacement of worn parts, and adjustment. A machine is fettled approximately once every five shifts, the process taking some 70 minutes' work by a team of four men. The decision as to when to fettle a particular machine was left entirely to the engineer's judgment, and no fixed plan was followed. The fettlers were found to be spending only 50 per cent. of their working day on the machines, and as much as 28 per cent. filling in on odd jobs. Any improvement in the productivity of the fettlers would thus mean that more of their time would have to be spent on odd jobs, which were already difficult enough to find.

As a result, a re-allocation of jobs was made. The fettlers were promoted to a low-grade engineer status and called "scribblers." Each of the four men was given

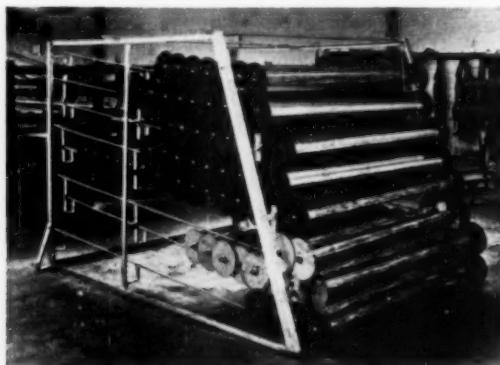
responsibility for the satisfactory operation of three of the carding machines, and this became his major task, occupying 60 per cent. of his day. The proportion spent on fettling was reduced to 25 per cent., the remainder of his time being spent in relieving other workers during lunch breaks, etc. An assistant scribbler was appointed to take over the general cleaning work previously undertaken by the card minders and to deputize for the scribblers as and when necessary.

This re-allocation of duties meant that the card minders were relieved of the loading, taken over by the scribblers, and the cleaning that took up 40 per cent. of their time. Whereas one minder previously supervised two carding machines, it now became possible for one girl to look after six machines, spending the whole of her time at the condenser end. The total staff of the department was thus reduced from ten to seven.

Output Up, Labour Down

A similar re-allocation of duties occurred as the result of the re-organization in worsted. With the original four sets of drawing machines, the two large sets were operated by six workers per set, the small sets employing five operatives each, with five operatives on oiling, sweeping and trucking. The three new sets employ five operatives each. The labour force has thus been reduced from a maximum of 27 (which was never reached in practice owing to the labour shortage) to 20, while production has risen. A similar re-allocation in the spinning room enabled an operative to mind six sides of spinning frames, against four previously. Changes in other departments, on similar lines, were recommended, but for various reasons could not be carried out. Re-allocation of duties between skilled and unskilled workers in frame spinning, it was claimed, would reduce labour by 33 per cent., but has not so far been carried out.

The precise allocation of duties has made possible the setting of fixed schedules of operations. In



A simple storage rack gets the bobbins off the floor and out of the way.

Look Out for WHAT'S NEW



EASY DISCHARGE . . .

SEALING joints in roofs, doors and window-frames where expansion causes movement, is the function of Seelastik plastic sealing compound. The material is difficult to handle, so it is applied with a specially designed gun. Refills, too, have been a problem, but plastics have come to the rescue and the compound is now packed in expendable Cellophane cartridges.



EASY RECHARGE . . .

REFILLING grease guns is another messy and difficult job, but here again the task is now made much easier with the aid of plastic packs. Refilling is achieved without mess, and air pockets and dirt cannot be introduced into the gun. At present the new pack is being used only for tractor grease, but it will be available for industrial lubricants in the future.



METAL TENT

PREFABS have become a recognized part of modern life, but few of them can claim such convenience, cheapness and portability as the Uniport Altent. Constructed of two standard type aluminium panels—for walls and roof—Altents can have doors and windows fitted if required. Dismantled, the 17 wall and 18 roof panels nest into each other and occupy very little space. A complete set of parts can easily be transported on a hand trolley. Three unskilled workmen can erect an Altent in an hour and take it down in half the time. Floor area is 160 sq. ft., eave height is 6ft. 7ins., and the diameter is 14ft. 4ins. Uses are many, but a few obvious ones are: on-site office, canteen, builders' or surveyors' offices, temporary offices and stores at shows or exhibitions—or even a polling booth.



Output Up By

He Believes in *Private Enterprise*
at All Levels



By A. K. ASTBURY

Time and motion study, joint consultation and other gods of modern scientific management hold little temptation for Ian Marriott, young managing director of the Parsons Engineering Co., Ltd., of Southampton. His formula is more simple trust your workers to do their job. And as three companies have found out—it works.

THREE times running, in different-sized engineering factories, Lieut.-Colonel Ian Marriott, managing director since April, 1950, of the Parsons Engineering Co., Ltd., Southampton, has achieved more than a 60 per cent. increase in production during the first year of his appointment. In his present factory—which makes marine engines and gearboxes—without the help of either new tools, new machines, or new equipment, he got a 62 per cent. increase in production in his first eight months. In addition, he turned a loss of over £25,000 a year into a profit of over £3,000 in the eight months alone.

His methods are certainly unorthodox. Many would doubtless dub them dangerous. But the fact is that they work.

He starts off, first of all, with the conviction that British management has not even begun to understand what planned production means. He would doubtless hesitate to say so publicly, but one

suspects that to him British industry, one or two glimmering points of light excepted, is about 20 years behind the Americans in this respect.

He assents, too, to another dangerous doctrine, less as a matter of principle than one of feeling: that workmen are human. He revels in the gregariousness of factory life, and would be painfully lonely there if he had not the companionship of his workpeople. He keeps his office door permanently open so that anyone—and he means anyone—may come in and see him, however busy he may be. This he justifies on the grounds of expediency—that the men on the shop floor are bumping up his production and that their difficulties must be dealt with the moment they arise; it is none the less true that he would probably feel very bored if that door were always shut.

He does not believe in joint production committees. Far from bringing men and management together, such committees, he be-

lieves, keep them apart and hold up greater production. Nor does he believe in backing his works manager and foremen, right or wrong. This is partly expediency, for he declares that although he cannot sack his men, they can sack him, and very easily; but another reason is that he believes in hearing both sides of a question, even when the complainant is his own nominee.

Most of his success springs, inevitably, from his own temperament. Vital, vigorous, in his late thirties, Marriott is well endowed with scepticism and blessed (or cursed) with an almost complete absence of veneration for established tradition. He brings to his task of running a company a lack of respect for custom so complete that many, doubtless, in places of established industrial security would regard, and do regard, him as an industrial anarchist. He would probably only answer that he takes private enterprise seriously.

He brings, too, to his task a facility of expression which owes something to the fact that, after serving an apprenticeship at Firth, Kent, with a subsidiary of the General Electric Company, he went to New College, Oxford, and read modern languages. Let him tell, in his own words, how he started on the road to industrial unorthodoxy.

"It all began" (he will tell you) before the war, when I was employed as an engineer on the staff of the production director in the Alkali Division of Imperial Chemical Industries; my job was to go round all the works in the group and bring down their costs to a bogey figure.

"While I was on that job I.C.I. became intensely interested in various systems of time and motion study.

"Now, ever since I served an apprenticeship side by side with men in an engineering works, I have been against any kind of system which forced men to do anything. Then I worked myself on the shop floor I wanted to do my work voluntarily; I want my men to do their work voluntarily, too.

Principles or Systems

"I therefore asked that I should be allowed to introduce my own system and see whether or not it could stand comparison with the more orthodox systems of job control. I almost filled my office with

four-dimensional coloured graph. It was a frightfully complicated example of the type and could defy immediate understanding on the part of anyone. It never meant anything to me. I then called in my key men and explained to them that they were faced with a choice: there were the orthodox systems, or there was mine. I told them, confidentially, that I really had no system at all, and that the thing on the wall was all eyewash. I had, however, a principle; all I asked was that they should themselves achieve better results voluntarily by cutting out waste time while one trade waited for another to do their part of the job, and by starting another job as soon as the previous one was finished, even if it was by then 11.30 a.m. or 4.30 p.m. To all others I said that the thing on the wall kept me in im-

mediate touch with every job in the plant, the men who were on it, how long they were taking, and so on.

"The men took to the idea at once, and as time and motion study produced results in one part of I.C.I., we produced better results in another part. In fact, things went so well that I was then told to introduce my system throughout three other factories of the group. And results were achieved, simply through the voluntary co-operation of the men.

"Later, during the war, I learned at the Staff College that the staff officer should always be approachable, however much work he has to do. If his door is always open to the man with a grievance, or the man seeking information, that officer will get far more information on what's going on than he would ever get in any other way.

"And so, in my three jobs since the war (as general manager of

Cowlishaw and Walker, Ltd., Stoke-on-Trent, coal-face machinery makers; managing director of W. G. Bagnall, Ltd., Stafford, locomotive engineers; and at The Parsons Engineering Co., Ltd.) I have tried to apply these things which I learned earlier—first of all, that men will do voluntarily far better than they can be forced to do by any system; and secondly, that if they know they can stop me on the shop floor and discuss their difficulties, or walk through my open door—and I mean open—and talk to me, then I know I shall be really on top of the job."

It is understandable that Marriott should have no time for joint consultation. "I believe," he told me, "that this machinery for joint consultation is the biggest single obstacle to increased production in British industry. If you have to be formal and sit round a table and produce agenda, and then minutes; and if the men have to

Marriott's Management Blueprint



- 1. Concentrate on planning production.**
- 2. Keep your office door open—to every one.**
- 3. Avoid formal committees.**
- 4. Choose the right man for the job and let him get on with it.**
- 5. Scrap works rules when they are clearly irrelevant.**
- 6. Don't support supervisors right or wrong: judge each case on its merits.**
- 7. Reward the man who produces results.**
- 8. Keep workers informed on profits and losses—and be honest about them.**

select their representatives and feed them with subjects for the meeting—well, the personal touch and all spontaneity are gone for ever."

Putting It Over

Personal contact, indeed, is vital to Marriott in increasing production. "The man at the bench can listen to people making speeches, or read what the manager has to say on the notice-board; but, in general, the results will be nonexistent. The fact is that the average general manager and the average workman just speak a different language; and if the chap at the top wants to know that he's getting his message over, he's got to talk to his men face to face, or in groups of, at the very most, 500. The vital thing is to make an impression; not to produce figures or slogans, but to leave an impression in the men's minds. For on that impression they will act, and action means work. I would almost go so far as to say that it doesn't really matter what you say; it's the way that you say it that matters. And this is something you can never get in a meeting. And for that reason I have always scrapped joint consultation machinery in any factory of which I have had control."

Tore Up Rules

These are no idle words. One of the first things Marriott did after his appointment as managing director of the Castle Engine Works, Stafford, was to tear down the green baize doors which sound-proofed his office; he allowed his men to smoke when they liked (they had previously smoked only on overtime); and arranged for them to be paid in the company's time and on a Thursday (which the men's wives preferred to Friday).

A series of works rules which were in existence on his arrival (one of them declared that the penalty for fighting in the works was instant dismissal) he tore up in front of the men. "It's silly having such rules," he told them, "when you know that to all intents and purposes I cannot sack you, but because of the shortage of



"I want a drill like that one," says the worker, and Marriott must find the right answer quickly.

labour, you could sack me tomorrow by not producing the output I want from you."

But this (the cynic may think) is all very fine. What exactly does the Colonel do in terms of man-hours and of actual improvements? He has a quick answer.

"The first thing I do is to find out the chaps who know their jobs and those who do not; and those who don't know their own jobs have to be removed as soon as possible. Then I say to the others: 'I am not going to tell you what to do. You are going to do it because you know your job, and you will merely use me as a sort of clearing-house for removing any troubles you may come up against.'

"For I have found" (he continues) "that nearly every man in control of a factory or company tries to do it all himself. He tells everyone what to do, and if anything goes wrong the blame falls on him. But if, right from the start, he put individual responsibility on every individual worker and member of the staff, and left it to them to get on with their job, and to consult him only when things got stuck—then he would save all the bottle-necks of centralized control. It means, of course, that he would have to pick his men

carefully; and that is the first thing I aim at doing."

After Marriott has explained to his men in no uncertain terms exactly how he thinks the factory should be run, there comes a trial period when the men try to decide whether or not he means what he says.

"This is a difficult and important period," says Marriott. "If one of the men stops you in the shop and says, 'My lathe's worn out. I need a new one,' you whole future may depend on the answer you give that one man. If you are caught out you are sunk. If you answer, 'No, you cannot have a new lathe,' you must say why not—and it must be a sensible reason. If you answer 'Yes,' you must be equally sure that you know the lathe is worn out, and that buying a new one is the way to deal with the matter."

Foremen May Be Wrong

"Once over that difficult period you are all right in one way—nobody will try to pull your leg! But then another difficulty arises. I was brought up to believe that the foreman and works manager must be supported by the management at any cost, and that their position

is untenable unless this is so. But I have come to believe that it is impossible to apply that rule under full employment when you daren't sack a man because you cannot replace him. And so I tell my works manager and foremen that I am not going to support them, right or wrong. They hate it, and I realize that it makes their position very difficult; but I listen to the men's case direct, and I listen to the foreman's case direct, and then decide. And my decision is not automatically in favour of the supervisory staff. Everyone outside says it's an impossible situation, but it works with me. These are all, of course, aspects of the one thing: the doctrine of personal responsibility. I put the responsibility on the men themselves, and then just wait for results.

Give Financial Reward

"But the men who produce results must be rewarded. The importance of personal appreciation and a word of praise at the right time are still as important as ever they were—more so. Best of all is to give a personal financial reward. If the company cannot immediately afford wage increases or

output bonuses, the next best thing is to buy some new machine tools to try to do away with some of the most obviously inconvenient things about the factory itself. Then the men can see that they are achieving something; they must have tangible proof that they are getting somewhere.

"Any progress in the first year, results from their efforts alone. It's usually common sense, putting into effect the things which have been obvious to them for years. But it is they who suggest them and put them into effect. When I told the men at the Castle Engine Works, for example, that certain locomotives being built under old contracts were produced at a loss, the men produced their own plan for cutting down the time spent on them, and one department alone saved a total of 7,000 man-hours.

"In the second year we profit by that time-saving in the first. New machine tools, the beginning of plant extensions and rearrangement—these also begin to take effect, and in the third year better overall planning will be an additional cause of greater and more efficient output."

Marriott has not stayed long enough in any of the three factories he has controlled since the war to face the problems which

arise in the third year. "But I'm not worried," he says. "When I headed the productivity team which visited the United States last year to study their diesel locomotive industry, I went into a factory just the same size as that which I then controlled in Stafford. I had increased output in my factory 60 per cent. in one year and was proud of it; but this American factory had exactly three times the turnover I had managed to achieve. No, we are so far from fully exploiting the possibilities of management in industry that I have no worries about what will happen in any factory at the end of that initial period during which the men themselves make the greatest contribution to increased output.

"At the end of the first year one has, of course, to have some plans, to know what to cut out, what is to be rationalized, to what extent the number of products made are to be reduced, what tools are to be dispensed with. In the third year a plant extension will probably be necessary, with an entirely new lay-out—and not only as a physical requirement for expanded business, but also for the sake of the morale of the men who have sweated blood for two years and produced a greatly increased turnover by their own efforts. At this stage their wives and relations should be invited to come and see where their menfolk work. The sympathy of wives and families has a very important bearing on output.

Be Honest

"And at all times scrupulous honesty about the company's profit and loss is essential. If the firm makes a loss one week, I tell the men so. There is a board in my present factory on which, each week, I stick up what is called our vital invoicing figure. Each week, unless so many completed engines or gearboxes are got out of the place, we are making a loss. And when there's a loss the figure on the board is red; when it's a profit it's green. And that information must be correct. If it were found to be wrong, no one would ever believe me again. Scrupulous honesty is the only basis for my policy of individual responsibility at all levels."



Employees must be kept in the picture with facts.

"See if there's anything in it for me," said the Editor of BUSINESS to an editor-colleague as the latter left the office recently. "This conference you're going to sounds right up my street". It was. Here's the result:-

How Market & Opinion Research Can Help Industry

By C. D. RANT, Editor, "Advertiser's Weekly"

FOR success in business, flair is essential, but flair must be applied to the interpretation and exploitation of fact. Sometimes the facts of a situation are self-evident. More often they are not.

How, the manufacturer may ask, can I increase sales, find new and profitable markets, expand the range of my products, improve relations with my workers? In answer to these questions, he will get opinions in plenty, but they will inevitably be coloured by the prejudices or interests of the giver. Their validity must be tested. To do this is the job of the market and opinion researcher. He can obtain facts that become a sound basis for action.

Research of this nature is no new thing. Its value is well understood by large manufacturers, who count the substantial sums they spend on it as money well invested. But its scope of practical usefulness is still not fully realized, and the means by which it gets its results remain a mystery to many. It is to be regretted that a number of manufacturers who could benefit by research, but have not yet used it, could not have listened to the discussions at Tunbridge Wells in September, when members of the European Society for Market and Opinion Research and of the World Association for Public Opinion Research met in joint conference.

Much of the discussion necessarily turned on what research can do to throw light on the problems of the administrator and the social scientist. It is with its applications in the commercial field

that we are concerned. Here, as was evident from the Conference, it can help in the following ways, to mention only a few. It can:

Give a reliable estimate of sales from retail outlets, in a given area, and over a given period, of the sponsor's products, and those of his competitors.

Find out what users, or potential users, think of a product, and how,

To get reliable information about potential sales, profitable markets and new products is the job of the market and opinion researcher. This is well known to many large manufacturers, but to others the scope and usefulness of research are still a mystery. This article explains what information can be provided and how it is obtained.

if at all, they would like it altered to make it more acceptable.

Ascertain the potential demand for a new product, or for an old product in a new market.

Find the reasons for sales resistance in a given market or area, and how it can be overcome.

Show how to solve the peculiar problems of sales promotion in a new overseas market.

Test advertisements before publication to discover whether they are likely to be read.

Test advertising in its various forms after publication to discover to what extent it is being noticed.

Help improve productive efficiency by finding out what factory workers really think about the conditions under which they work.

How is all this done? To answer this question adequately would require a book, but at the risk of over-simplification, I will try to outline in plain terms—for the language of research bristles with technical jargon—the methods commonly used. Here is a simple example.

It may be desired to check the potential market for a new appliance that the makers believe will be useful to garage proprietors. The first step is to obtain a list of garages from directories and similar sources. Lists are not always easy to get, but in this instance there would be no great difficulty. Let us assume that the list contains 20,000 names of garages offering a reasonable sales prospect.

The next stage is to obtain a sample, from a test of which the reactions of the whole can be assessed. There are two principal sampling techniques—that using the random or probability sample, and that using what is known as the quota sample. These have many permutations and combinations.

A random sample would be obtained by taking, say, every fortieth name in the list, giving a sample of 500.

To obtain a quota sample, steps would be taken to get a represen-

tative cross-section of the total. This total would include varying types of firm, such as service garages and filling stations, to take two major categories only. There would be large garages with several dozen employees, and small ones with staffs of two or three. Geographical distribution would be unequal. The total would be analyzed in the light of the best available information to get a breakdown showing the nature and location of its constituents.

The sample, which would probably be 500, would then be broken down so that the proportions of the various groups to each other were the same as those shown by the breakdown of the total. For example, if there were 8,000 service garages, 10,000 filling stations and 2,000 other types, the sample would contain 200 service stations, 250 filling stations and 50 others. There would be a further breakdown of these groups in proportion to large and small businesses and to allow for geographical distribution.

Once the sample has been determined, the next process is to interview the names selected. This is normally done by trained interviewers, using a questionnaire which must be drafted with skill to ensure that the answers genuinely reflect the facts disclosed, or views given by, the person interviewed.

In the final stage the researcher will collate the replies and present his findings in a report that should tell the sponsor what are his chances of success in launching his new product, and how he should set about it.

The random sample method is regarded by many research practitioners as the best and essential for certain purposes. It proves somewhat costly to operate, because the informants are, of necessity, widely scattered. The quota sample technique, despite some disadvantages, is claimed to give results that have proved to be just as reliable as those resulting from a random sample. As was pointed out at the Conference by Mr. Tom Cauter, of the British Market Research Bureau, it is both less costly and comparatively speedy. He put the point succinctly by saying: "It is no assistance to sell a man a large steam hammer if he wishes to crack a nut."

Scepticism is often expressed of the validity of such small samples. The answer to this is that the proof of the pudding is in the eating, and that this particular pudding has been eaten often enough to prove its qualities. Evidence in plenty was produced at the Conference. It was shown by Mr. A. Bakker, of Holland, that results of a survey on a small sample were subsequently confirmed by a much larger sample, and also that results of a sample survey were confirmed by a subsequent census of the whole population.

Research, of course, can be used in numerous ways to increase the efficiency of sales promotion. It can test the consumer reaction



Harry Jones, president, Advertising Creative Circle, wants research to find relationship between advertising and sales.

to package design. It can indicate the best theme for an advertising campaign, but there is some controversy as to whether it can, in fact, establish relationship between readership of advertisements and actual resultant sales. At Tunbridge Wells, Mr. Harry Jones, of Mather and Crowther, advertising agents, and president, Advertising Creative Circle, challenged researchers to do this. In reply, Dr. Henry Durant, of the British Institute of Public Opinion, pointed out that advertising was only one of the many factors affecting sales. "All copy testing can do," he said, "is to tell whether an advertisement has a good idea in it, and whether that idea is being got across to its readers." If the product itself is wrong, the best advertising will not maintain its sales.

Dr. George Gallup, of U.S.A., contributed an interesting adden-

dum. Investigation of the success or failure of advertising campaigns by a U.S. agency, he said, had shown that where readership of advertisements was high, sales proved satisfactory. It is, he asserted, possible to forecast sales, and this had been done for the book publishing and film industry with success. But, obviously, factors other than advertising must have been taken into account.

Another point made by Mr. Jones was the need of manufacturers of technical products—the tools and materials of industry—to find new outlets. He challenged market research to show where such outlets lay. There is no doubt that this challenge can be met. Research can also ascertain what means of sales promotion, and what advertising media, are most effective in this highly specialized sphere.

One of the most interesting addresses was that by Mr. Graeme Cranch, president of the Market Research Society, who described methods he had employed to assess worker opinion on the conditions in factories. This was done by using specially qualified investigators to interview a random sample of the workers under conditions that ensured their speaking freely.

A final word about the market and opinion research profession. Any impression that its approach to its work is theoretical and unrealistic would be mistaken. Its outlook is intensely practical, and its members, though confident of the validity of their techniques, are by no means complacent. They are perfectionists, deeply concerned to improve their methods still further, and so assure their clients an even higher standard of accuracy. They are conscious, also, that standards of integrity must be established so that users can distinguish between good and bad practice. Members of E.S.O.M.A.R. have adopted, and all agreed to implement, a code based on such a standard. Thus the user can employ research practitioners in the most important European countries knowing that he will be given an honest job competently conducted. It should be a matter of pride that the initiative for the formation of E.S.O.M.A.R. and its subsequent achievements came from members of the Market Research Society of Great Britain.

How to Recruit Salesmen Who Will Make the Grade

By E. J. ORNSTIEN, A.I.P.A.,

Managing Director, Max Ritson & Partners, Ltd.

THE advertising practitioner has nowadays to assist on many matters not directly concerned with advertising. Here is a question that came to me recently from a client selling a speciality for business firms:

"Out of every 10 salesmen we engage, only one makes the grade. In six months, the other nine have faded out. Can't you find some brilliant wording for our 'Want Ads.'—or some new advertising media—that will help to sort out the sheep from the goats?"

It is not as easy as that. Advertising to sell jobs has this in common with advertising to sell goods—that "brilliant" words are not the essential. The right wording can certainly help—chiefly in the direction of eliminating some of the unfit. *But the really hard job starts when the applications come in.* Getting the enquiries is easy; selecting from them is the difficult matter.

This particular client had almost thrown up his hands when he came to selection. His experience was that you cannot judge a salesman by his looks. Once you have made the elementary selection of those who look reasonably honest, intelligent and decent in appearance, it is very difficult indeed to judge who will or will not make a salesman. Many different types succeed. The fact that you like a man does not necessarily mean your customers will.

So, this client's method was: after the first elementary tests, and a week's "selling school," put them on the road. Results will find them out.

This is an expensive method. Also, it is dangerous, because it means putting on the road men who may damage the prestige of the firm. And there are methods of pre-selection—harder in time and trouble for the sales director, but well worth while in the long run.

We advised this client: look for recommendations. Every businessman in an influential position is repeatedly asked for advice by young men wanting jobs. Such businessmen often find it difficult to give clear guidance; they would be glad to know you are in the market for salesmen.

Write Letters

Personal contact by the sales director with these "spheres of influence" is the obvious first step; but it is limited. So, why not write to them? Make out lists of the likely people in the cities you wish to cover—the chairman of a business club; the managing directors of leading businesses; a prominent solicitor or chartered accountant; the bank manager. In some cases, the principal of a public school or technical college can be helpful.

Don't hesitate to write fully to these recommenders. A "sphere

of influence," faced with a young man seeking advice on a change of job, has only a very general idea of the needs, conditions and advantages in an industry other than his own. Even if he has the knowledge, he has not the time to explain in detail. It would be a real convenience for him to have some printed matter which he could hand to a likely man: "You look the sort of chap who might be able to sell for Blanks. Take this booklet. If it appeals to you, get in touch with them, and mention my name."

We have recently devised a booklet for just this purpose. It describes the specialized work of the salesmen for the company concerned. It stresses the difficulties; it also outlines the attractive prospects. It implies, rather than declares, the prestige of the company. It is *advisory rather than persuasive*.

This booklet saves a lot of trouble for the "sphere of influence." It facilitates recommendations. Also, the firm find it very useful for sending to applicants from "Want Ads." to give them a thorough idea of the job before the personal interview. It helps them to *select themselves*.

Of course, careful personal selection is still needed. One firm, using both "Want Ads." and recommendations, goes to very great trouble in selection. A first principle is: *never appoint on the enthusiasm of a first interview.* A

good man will seem better on a second interview; and *vice versa*. Usually, the branch manager has several interviews with a likely applicant; sees the man in his own home, gets to know his wife, gets to know his background.

The applicant is also given a psychological test. There are 93 questions in it! They aim to get a man's reactions to everyday life—how he behaves at a party; what he likes doing in his spare time; the way he thinks; and the things he believes in. The questions have been proved to have a close relationship to success in the selling of this particular service.

The examples I have quoted are from speciality selling. Do the same considerations apply in the selling of staple articles—by "commercial travellers" calling on retail stores with lines for them to stock and repeat?

Careful selection is just as important here—because the traveller will have to be calling on the same customers again and again; friendship and mutual confidence are absolutely vital. A traveller who does not make friends will lose friends for his employer.

Knowing the Firm

Many sales managers in their recruiting insist on "a man with a connection"—i.e., with friends ready-made. There is nothing wrong with this. But, equally important is that the representative should really be able to represent the firm; that his ways of thinking should be in line with those of his employer; that he should understand the firm's policies and methods.

You cannot find this out in a single interview. Nor can you expect any man to imbibe the whole atmosphere of a business in a short time. For this reason, one firm insists on every new traveller spending six months in the factory before he is allowed to go on the road. He is given minor office jobs to do in the sales department; he has plenty of opportunity to wander round the works and see the quality of workmanship going into the goods he will have to sell; he sits in at sales conferences, advertising conferences and works conferences.

Is a connection really necessary? Isn't it sometimes worth starting

5 Ways To Save Time and Money

1. LOOK FOR RECOMMENDATIONS

Tell local business and professional men you want salesmen. These "spheres of influence" can often pass young men on to you.

2. ISSUE A BOOKLET

Describe your firm and your needs, conditions of work, prospects, etc. Send this to (a) local business-men, (b) applicants themselves.

3. TAKE TIME IN SELECTION

Interview an applicant at least twice, however good your first impression. Try to see him in his own home amid his family and hobbies.

4. WELCOME THE NEWCOMERS

The salesman will be your ambassador. Give the new man time and facilities to settle down and learn about you, your goods, your production and selling techniques.

5. RECRUIT FROM WITHIN

There may be potential salesmen in your own office or factory—men already loyal to you. Seek them out, and try them on the road.

with an entirely fresh man? In my view, it is almost always worth while if you can find the right material. An established traveller is bound to have picked up some "vices" from his former employers, as well as virtues and a connection. A tyro, if he has "what it takes," and if you give him the right training, can be a good investment.

The most likely place to find him is in your own organization. Is there a bright youngster in the office—keen and alert, but perhaps a little impatient—who might like to try selling? Or, even, are there men in the works who may have selling ability? I know a firm now building a successful sales force from its own workpeople alone.

Obviously, this would not work in all trades. The firm in question sells to farmers; and these workpeople-salesmen can talk to farmers in their own language. Always a good point.

One final point which applies

through the whole process of recruiting salesmen, from the wording of the advertisement to the moment of engagement: *money is not everything*. Those workpeople turned salesmen earn little more on the road than they did on the bench. But they have stepped up a grade in the eyes of their fellow-workers, and of themselves and their families. A man likes to be well thought of, and to think well of himself. Further, some young men are idealists. They like to feel they are doing a job that's worth while in the community.

It is wise to put some emphasis on this aspect in "Want Ads.," in literature for recommenders; and at interviews with applicants. Indeed, a firm that has some idealism in itself—and manages to convey something of that idealism in its general publicity—will always attract the better type of employee. And the higher type of salesman will attract a higher grade of customer!

This Simple Form Allows

By JULIAN ACOMB

IT had always been the ambition of Mr. Ernest A. Bligh, A.C.I.S., to develop for businessmen a method of recording minute-to-minute cash transactions in which the writing of figures was unnecessary; in which total takings could be accurately and swiftly assessed at any one moment; and in which the daily record, hurriedly prepared at the cash desk or shop counter could yet be used for accountancy and income tax purposes in the preparation of a final statement of accounts.

Two important considerations made him realize the need for such a method of accountancy: the time and money which businessmen, particularly in shops doing a cash trade, lost through the inefficient recording of transactions; and the money and time they lost through being unable to submit for taxation purposes a full account of all money paid out during the course of business. Although those running a cash business might be alive to the importance of speed in serving customers, they were rarely alive to the need of accurate recording which could save them money. Even if transactions are faithfully recorded at the time, there is still the problem of book-keeping at the end of the day or month. It was Mr. Bligh's experience—as a shopkeeper himself—that those who have a cash trade are seldom good book-keepers.

The scheme, which has already been proved in a number of London shops, depends on the use of a pad by the shop assistant or the cash desk clerk. Provided all transactions are recorded on the pad, the money may be kept anywhere. Each page in the pad can record small cash receipts up to a total of just over £60. In the ordinary way one page will be enough for the day's takings of one assistant, but if necessary more than one page may be used. Special

- ● ● Minute-to-minute cash transactions to be recorded without writing figures.
- ● ● Total takings to be assessed at any time of the day.
- ● ● The one daily record to be used for accountancy and income tax purposes.
- ● ● The system to be used for preparing comparative tables of trading or graphs showing the amount of business done.

spaces are provided for the entry of large sums and cheques.

The whole basis of the register is that no figures are written down for minute-to-minute transactions; figures are simply crossed out to correspond with the sum taken. The figures to be crossed out are arranged in columns under cash headings, ranging from 10s., 5s., 3s. and so on at the left, down to 1d. at the right. This line of cash headings, which appears in heavy print at the top of the column, is repeated twice below, half-way down the columns and again at the bottom of the columns; these are merely guide lines to make for easier reading.

Cash Recording

The highest undeleted figures in the appropriate column is crossed out to correspond with the cash taken; and the figures immediately below the deletions will automatically show the money then in hand. Thus if the sum of 5s. 11½d. is taken, the assistant crosses out the top figures in the 5s., 11d. and 1d. columns. The figures crossed out will at first be noughts (they could, in fact, be any other symbol); the important thing is that with their deletion the figures remaining below the deletions—5s., 11d. and 1d.—show the amount of cash taken). If the next taking is then 5s. 7½d., the highest undeleted figures in the 5s., 7d. and 1d. columns will be crossed out—5s. in the case of 5s. column, and nought in the case of both 7d. and 1d. columns. This

method of crossing out continues throughout the day; no figures, however, are crossed out in the last line of all, for these represent the final totals in each column.

As shown on the next page, although the pence, and divisions of a penny, run consecutively—that is to say, 1s., 11d., 10d., 9d., 8d., 7d. and so on, not every individual number appears in the shillings. In the case of 19s., for example, it would be necessary to delete the top figure in the 10s. column and (say) the top figures in the 5s. and 4s. columns. In practice this presents no difficulty.

In time, most, if not all, the columns will have deletions. Then at the end of the day (or at any other time) the total of the day's takings will be the addition of the highest undeleted figures in each column. There is, in the bottom left-hand corner of the form, a space where the less arithmetically agile may write down the final figure from each individual column preparatory to totting these up in the usual way.

There is a space, at the top of the left-hand "Takings" column, for filling in the amount of cash remaining over from the previous day's business (the "float"). Large takings—£5 or upwards in notes, for example—may be entered lower down in this column, thus relieving the centre columns. There are spaces, too, in the takings column for cheques received, and under the heading, "Self," spaces where the bringing in of more money from reserve may be

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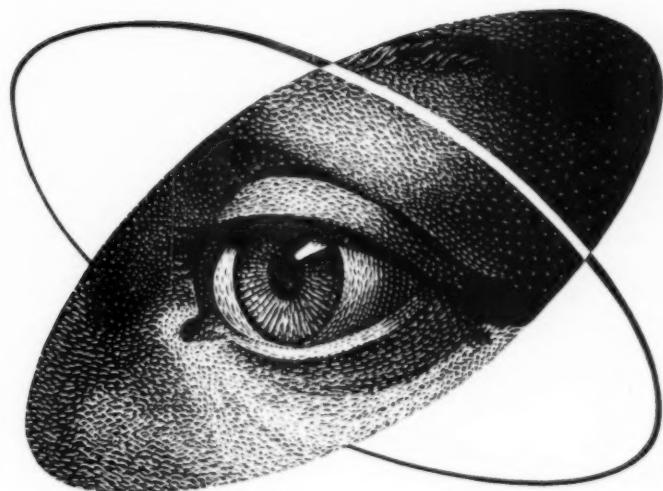
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Final		10	3	4																			
(Yesterday's Cash in Hand)																							
Cheques	5	2	7																				
	3	4	1																				
	7	5	10																				
Large Takings	3	10	-																				
	4	6	-																				
	4	17	6																				
Colours	10/-	6	10	-																			
	5/-	2	10	-																			
	3/-	18	-																				
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Today's offices are getting noisier because of increased mechanization. Noise means lower output, more sickness absences. Modern insulation methods—as described in this article—are an effective answer.

Less Noise Means Higher Output in the Office

By A. G. THOMSON

NOISE in the office is more than a nuisance, it makes work harder and reduces productivity. The effect on the operator is increased fatigue, strain, headaches and nervous complaints, and eventually sickness absences.

Mechanization has involved the large-scale use of machines, and although manufacturers have minimized the amount of noise they make wherever possible, complete silence is impossible. But noise is not, altogether, a necessary evil. It can never be entirely eliminated (even if that were desirable), but it can be kept within reasonable bounds. The answer lies in modern methods of insulation.

When the engineers of the Ford Motor Company, Limited, were asked to tackle the problem of noise in the offices adjacent to the works, they first turned their attention to noises penetrating from outside. This was overcome by fitting windows with a system of double-glazed sashes, fixed about five inches apart. Noise from the factory was cut down appreciably.

Noise in the offices naturally varied from room to room. The worst was the punched card department, where it was effectively reduced by the provision of a cork tile floor (insulating the machines at the base) and an acoustic tile ceiling. Acoustic tiles were also used successfully on ceilings of rooms in which office printing and duplicating machines and typewriters were operated.

Machines are not the only source

of noise. The human voice, though not so loud, can be equally distracting. In Ford's Purchase Department, for instance, office workers at adjacent desks were often making trunk calls to distant towns at the same time, and experiencing difficulty in hearing their callers distinctly. In this room, however, the ceiling contained hot water coils for heating, so that acoustic tiles (which also give insulation against heat) could not be used on the ceiling. But it was found, after experiments, that by fixing acoustic tiling to the relatively small wall surface be-

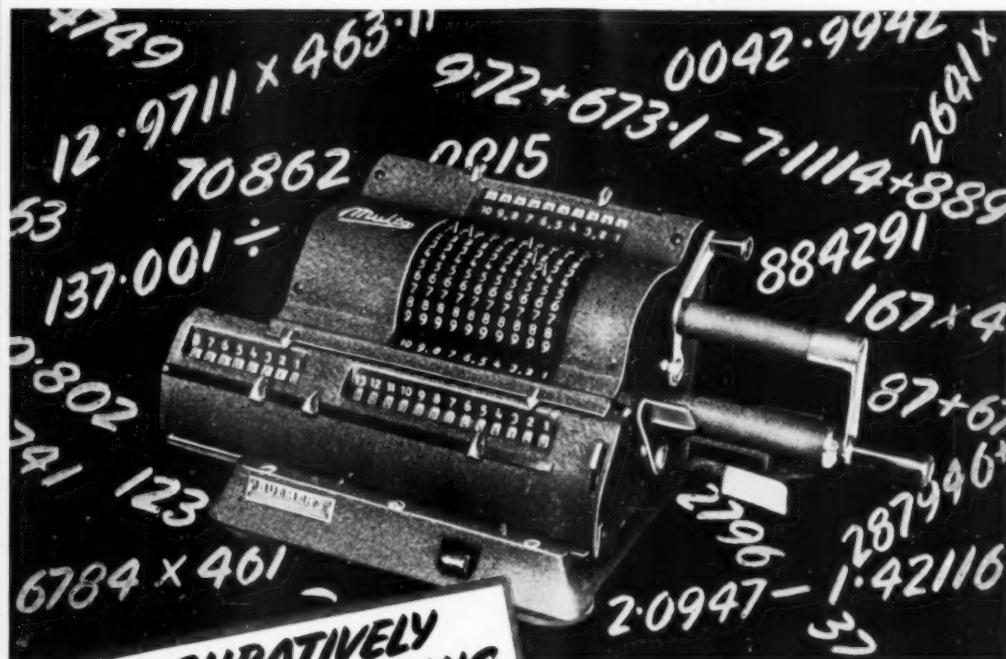
tween windows and on the face of the internal plastered columns considerable benefit was obtained. The decision to treat the whole department in this way, including the end walls, has been completely justified.

In the main telephone exchange it was possible to cover the ceiling with tiles. A spongy rubber floor also reduced noise, while providing a decorative and comfortable floor covering.

Another firm that has made large-scale use of acoustic tiles is Glaxo Laboratories, Ltd. Here

At Platers and Stampers, Ltd., office noise has been cut down by fitting acoustic tiles to the ceilings.





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The telephone exchange at the Ford Motor Company, Ltd.

unbroken areas of wall and ceiling have been treated wherever they occurred, to stop sound reflection. Walls which are sufficiently broken up by doors, windows or buttresses have been left untreated, since they were considered satisfactory from the acoustical

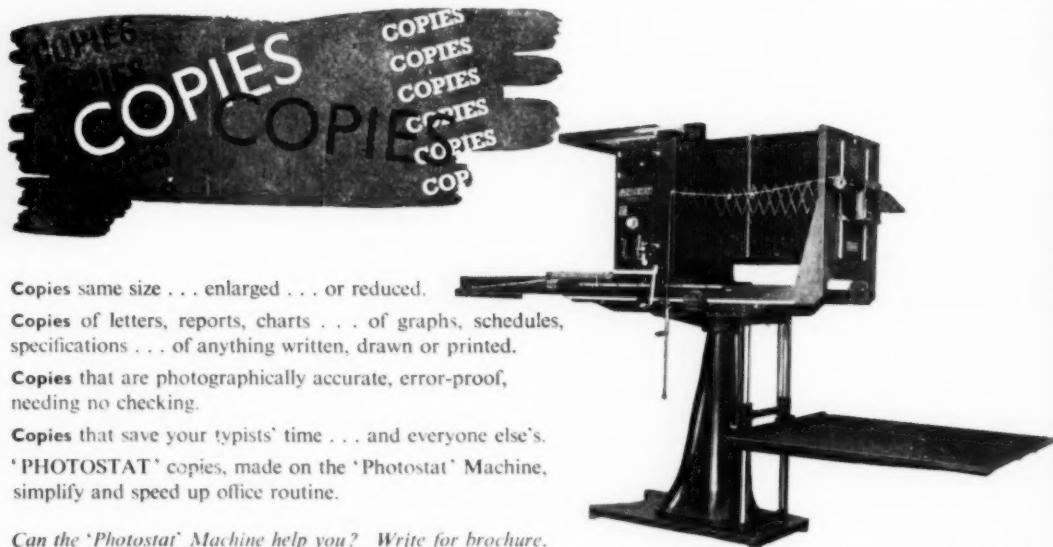


Part of the editorial department at Reuters, Ltd., where the noise suppression problem was solved with acoustic tiles.

point of view. An exception has been made in the case of the punched card room, where the entire ceiling and the upper two-thirds of all walls have been covered with tiles; in another room containing 14 miscellaneous machines the same treatment has

been adopted. These rooms are now surprisingly quiet; in particular, it is noticed that the various different noises no longer merge to produce a cumulative effect.

The offices at Ford and Glaxo are housed in comparatively



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modern buildings; in older buildings, the noise problem is usually even more serious. When Platers and Stampers, Ltd., moved their London offices to Holborn, they found that the structure of the building was such that noise from one office was readily transmitted by a wooden floor and low ceiling to other offices in the suite. Carpeting all floors would have been expensive, so acoustic tiles were fitted to the ceilings. This reduced the level of noise so radically that, in spite of the fact that the machinery included a punched card installation, it was no longer found necessary to shutter off the telephone operator.

Effects Cumulative

A particularly difficult problem in noise suppression was presented by the editorial department of Reuters, Ltd., which occupies an entire floor of a London building. The mechanical equipment in use includes about 80 typewriters and nearly as many teleprinters, as well as 15 perforators and transmitters. The din had to



The punched card department at Platers and Stampers, Ltd.

be heard to be believed, yet news reports are continually being received or despatched by telephone, and the highest standard of accuracy is required.

Experience in Reuters' former

building showed that the effects of noise are cumulative. In order to make themselves heard, reporters had to shout when dictating to machine operators. Because of the shouting, various bells and signals

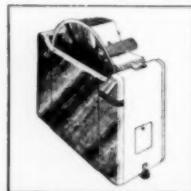
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had to be made louder. Because the telephone bells were louder, people had to talk louder and could not hear the buzzers. Eventually the tumult reached such proportions that a hooter resembling a miniature fire alarm was installed. This was too much for everybody, so that it became urgently necessary to consider ways and means of reversing the vicious circle.

The installation of an acoustic ceiling has improved conditions enormously in the present building. Since the offices are in use for 24 hours a day, every day, this treatment had to be applied without any interruption of normal routine, a problem which does not usually face the commercial firm. The work was done at night, when the staff was a little thinner than during the day, and the entire installation was carried out with remarkably little disorganization.

There is still considerable noise, but the level has been greatly reduced, and the staff are less conscious of individual sounds, which are the most distracting.

Reporters no longer make for a relatively quiet corner when work requiring close concentration has to be carried out; and telephoning



Acoustic tile ceilings in the Ford Motor Company's Offices.

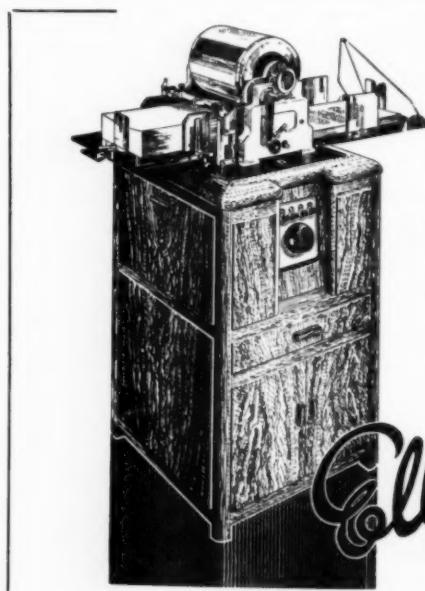
has become so much easier that it is unnecessary to go to a 'phone box when an important call has to be made.

The noise of the teleprinters, which formerly used to be thrown up and reflected back, now tends

to be absorbed by the ceiling. From a hard click the sound of the perforators has been subdued to a dull, metallic thud. A small soundproofing barrier had previously been erected in front of a group of perforators, but this did not solve the problem because the noise came back instead of floating away. As one of the operators phrased it, the noise used to "slip back at us."

Reuters have devoted considerable attention to the suppression of noise at source. Silent typewriters proved unsuitable, because the machines must be capable of withstanding constant rough handling. But a useful reduction in noise has been achieved by mounting all typewriters on rubber mats, and by the provision of more effective sound-proof covers for teleprinters and perforators.

The acoustic arrangements at Reuters are still in an experimental stage, pending the introduction of a new layout of the editorial department, but it is hoped that eventually, when the soundproofing of machines has been accomplished, it will be possible to provide the best possible working conditions for the editorial staff.

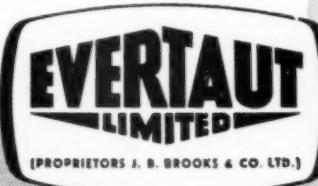


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The panel and day book sheet-in position in the visible ledger.

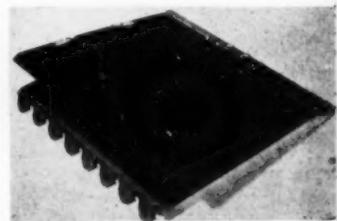
edge signals, allow rapid fact-finding and give quick indication of stocks, credits, sales, etc. Multiple copying, on the other hand, enables several entries of such things as P.A.Y.E. records to be made with a single writing. For instance, the employee's pay-slip, his permanent record card, and the pay-roll can be filled in simultaneously.

With a newly-developed system, both these methods have been combined, and the result will save much clerical time and labour, give a higher degree of accuracy and control to the businessman, and permit an instant visual check of all accounts.

The simplicity of the system is one of its outstanding features. A two-leaf metal panel with a sliding hinge has a row of interlocking lugs on the other edge that grips the prongs of the visible record ledgers.

A typical business procedure can be used as an example of the

way the system works. Charging up or receiving a payment, posting the transaction to the customer's account, making out the statement and entering in the day book, normally entail, first, finding the account in a file, and then making three separate entries. With the new method the account is permanently in position in the visible ledger. Slipping the slotted panel



The slotted and hinged panel.

—with an attached journal or day-book sheet—under the account page enables the three entries to be made together. Two advantages of the system, apart from the obvious ones of reductions in clerical work and the chances of error, are: statements are prepared transaction by transaction, and are ready to go out at any time; this

Air Comfort ALL THE YEAR with AEROZONE

All-the-year-round health and comfort for factory workers from one fully-automatic unit! Correct air temperature and conditioning in winter . . . ventilation in summer . . . and strictest fuel economy. In addition, an Ozonator can be filled for revitalisation. Literature on request. For suspension or stand mounting.

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Calculating jobs without Trained Operators . . .

"THALES"

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Destroy confidential records, documents, blue-prints, drawings, with

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the new shredding machine. Operates quietly—cleanly—safely.

•

Personal writing machine . . . introducing the world's light-weight champion portable typewriter

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2-Drawer Steel Filing Cabinet . . . Made from high-grade materials — fire-resisting hygienic and rust-proof . . . Mounted on castors . . . Locking . . . accommodates suspension filing.

HORLER TYPEWRITER COMPANY

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Cable: TYPANADD, LONDON.

Grams: TYPANADD STOCK, LONDON.

Phone: LONDON Wall 5858/9

eliminates end-of-the-month bottlenecks. Secondly, the state of each account is always indicated by a protruding section, perforated parts of which can be torn off to show when payment, etc., is due.

The system is particularly suitable for use in offices where machine accounting is impossible, for it incorporates most of the advantages of mechanized methods plus those of constant visibility.

—Enquiry Ref. No. O.12/1.

Dictation on Wire

Up to one hour of dictation can be recorded on a single spool of wire only a couple of inches in diameter with the Panrek Executive

wire recorder. Unlike most machines of this type, the Executive has been specifically designed for dictation and is not claimed to be suitable for recording music, radio programmes, etc. Controls have been cut to a minimum; there are only two: one for on/off and volume, and the other a three-position switch that selects either record, playback or rewind.

Dictation is picked up on a sensitive crystal microphone, which can be held in the hand or placed on a table up to 20ft. away from the speaker. A built-in loudspeaker or a stethoscope head-set can be used for transcription. When the head-set is plugged into its socket the loudspeaker cuts out. A footage counter is fitted to the

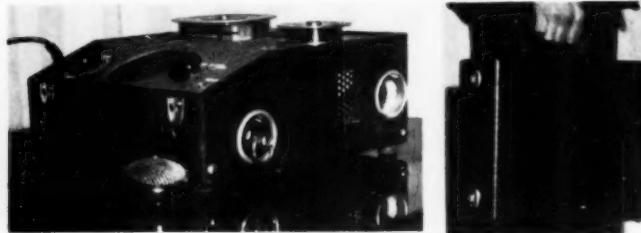
machine, and if a note of the reading is taken when each letter or memo is started, finding any particular place on the spool of wire is easy.

A foot control enables the transcriber to stop and backspace without removing her hands from the typewriter keyboard. Telephone conversations can be recorded with a "phone reporter" that is placed under the instrument.

The Executive is a truly portable machine, for it measures only 10ins. by 10ins. by 6ins. and weighs 22lb. It is fitted into a rexine-covered case, complete with carrying handle and four snap locks. The metal top of the unit is finished in a fawn crackle enamel, and the fittings are chromium plated.

Operation is from 200/250 volt a.c. mains, and the cable, plugs etc., wind inside the lid when the machine is not in use.

—Enquiry Ref. No. O.12/2



The Executive recorder ready for use, and packed in its case.

Mechanical Rolling

A POPULAR method of despatching magazines, bulky sales literature and similar material is to roll them in wrappers. This method eliminates folds and is more economical than enveloping. A new machine

The Modern Clock for the Modern Office



Retail Prices including P.T. as follows :—

6" dial £3. 19. 4.
9" " £5. 12. 11.
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No clock could be more in keeping with the modern office than the Smiths 'Sectric' Delhi, with its clear, easily read dial and smart



but dignified appearance. It is one of the most popular wall clocks in the Smiths 'Sectric' range. Available with 12", 9" and 6" dials.

SMITHS 'SECTRIC' CLOCKS



SMITHS ENGLISH CLOCKS LTD Sectric House, London N.W.3. The Clock & Watch Division of S. Smith & Sons (England) Ltd.

FIGURE-WORK
AT YOUR FINGER-TIPS



Although it is a simple matter to operate a Sumlock Adding-Calculator, you will probably never use its keys more than a tentative

But your operator's fingers, running over the rows of keys, are sure that the figure work of your business is at *your* finger-tips.

Sumlock is a light, streamlined precision-built instrument that can do anything with figures in any currency. It adds, subtracts, multiplies, divides, and gives answers in decimals when required. Whatever your business, it is our business and we are sure to produce the machine that will bring figure-work to your finger-tips.

SUMLOCK
A MACHINE TO RECKON WITH

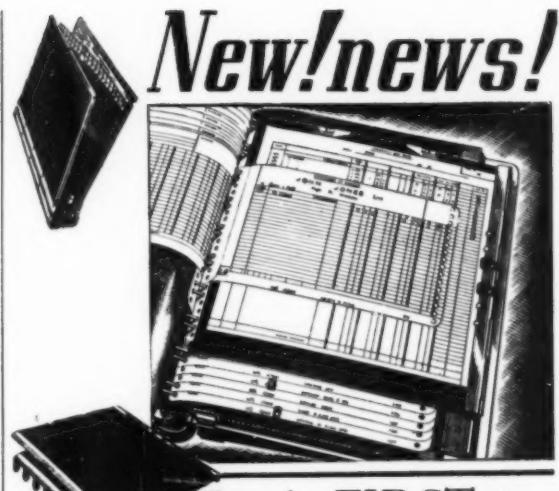
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REGENT 1331

DECEMBER, 1951



For the FIRST time
VISIBLE RECORDS
Plus *Multiple Entries*

First is the streamlined Shannoleaf binder holding hundreds of visible records. It is fast and compact. It is simple and portable. One clerk can control anything up to 12,000 records—all within arms' reach. Below it is the Visicopier. It permits multiple entry of any Shannoleaf records. It eliminates work and errors. It saves bottlenecks. It gives close daily control of accounts. It provides day-to-day check on stocks, wages, payments etc., etc. The whole system is simple enough for any clerk to operate. It is going to revolutionize office routine.



A number of progressive Executives insist upon using Visible records—and for very good reasons . . . They like to see instead of search. On the other hand, others use records which permit of multiple entries. For this saves an enormous amount of clerical labour. But until now they simply couldn't have BOTH. Now they can. Now they are able to combine the fastest visible recording method with double or triple entry.

What does this mean?

It means they can use Shannoleaf records for the fastest most compact methods of controlling stocks, purchases, customers' records, personnel, hire purchase, etc., etc. It also means they can post statements, ledger sheets and journal entries at one and the same time—without the need for finding them. That means 66 2/3 per cent. less clerical work and margin of error. It means errors confined to one day's postings. It means day to day check on all figures—with ready balances. It means a visual check on outstanding debts. It means statements ready to send out at any moment . . . Virtually, it means machine accounting without machines! Every Executive who wants faster output, reduced labour, less overhead costs should investigate this NEW and latest Shannon contribution to greater efficiency at once. Just jot "Multiple Visible Entries" on your letter-head and full details will be sent you by return.

Shannon Systems
FIRST IN FILING
THE SHANNON LTD.
100 Shannon Corner • New Malden • Surrey

enables this work to be done at high speed. One girl can now deal with 2,000 magazines, etc., an hour; nearly ten times as many as with hand methods.

The machine is designed in three separate units, the first of which holds the stack of wrappers, gums them and feeds them through to the second unit, where the material to be wrapped falls on them in a predetermined position. The third unit performs the actual rolling and ejects the packet ready for mailing.

Adjustments are provided for thick or thin material, and different sizes up to a maximum of 14ins. by 12ins. can be handled. Overall size of the machine is 45ins. by 45ins. by 35ins. wide, and the weight is 300lb.

—Enquiry Ref. No. O.12/3.

Light-Touch Calculator

SO light is the touch of the new sterling model of the key-driven Addicaleco 53 calculator that it is almost as easy to operate as an electric machine. Capacity of the machine, which has a 12-column keyboard, is one farthing less than £1,000m. An error control is fitted and this comes into operation if a key is only partially depressed. It allows the error to

be corrected without disturbing the total already in the machine.

Clearance of the dials is by means of a streamlined alloy knob, and decimal points are indicated by a novel system of white spots that appear between the letters when a small setting lever is operated.

The machine is enclosed in a well-designed case with chromium fittings and is finished in grey, non-glare enamel. It weighs 23lb.

—Enquiry Ref. No. O.12/4.

Labour-Saving Duplicator

LATEST addition to the range of Fordigraph hand-operated spirit duplicators has been named the *Princess*. The machine is fitted with automatic roller mois-

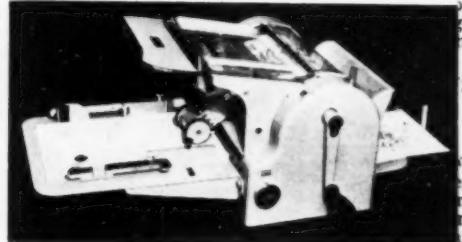
tening and fluid control. This eliminates the moistening margin and the level of fluid is shown at all times by an indicator. Paper feed is automatic and is by means of self-aligning rollers. The insertion or ejection of the master is controlled by the touch of a finger on a lever, and a masking device can be operated without removing the master from the machine.

Copies in a large range of sizes can be produced on the *Princess*. The minimum is only 1in. by 3ins., whilst the maximum size it will accommodate is 9½ins. by 16ins.

A built-in counter, automatic alignment of pressure and finger-tip registration control are other features of the machines.

—Enquiry Ref. No. O.12/5.

Though hand operated, the *Princess* duplicator incorporates many automatic features.



The Complete wage check!

Twinlock Wages Systems help Employee and Employer. Employees receive in their pay packets replicas of calculations from which net wages are computed. Queries are settled immediately.

Employees produce their essential Wage Records at one writing—saving time and eliminating risk of copying errors.

Illustrated folder gladly sent on request.

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3 - 1 WAGES SYSTEM

Superseding the Use of Discs, Wire and Tape

Hundreds of leading British industrial and commercial undertakings have already installed the

DICTOREL

The Reliable
Magnetic Dictating Unit



AND HERE ARE SOME OF THE REASONS

Customers' Report

The machine is so simple to operate and we prefer the sheet of paper as the recording medium.

Our typists are so keen about the quality of reproduction and the easy reference back or forward to any desired point in the dictation.

With the constant use and re-use of the same sheet costs are cut to infinitesimal proportions.

WE GET 100% RELIABILITY

Notes for Prospects

There are no confusing knob or switch controls and you can feed the sheet of paper in faster than your note-heading into a typewriter.

No other machine possesses the instantaneous playback and pin-point index reference back or forward.

One dictogram sheet can be used and re-used indefinitely. Erasure is automatic with each fresh recording.

All our users will readily substantiate this claim.

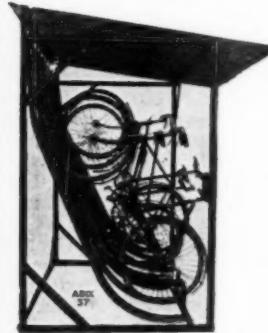
with the DICTOREL Magnetic Dictating Unit.

Write, call or phone for a demonstration.

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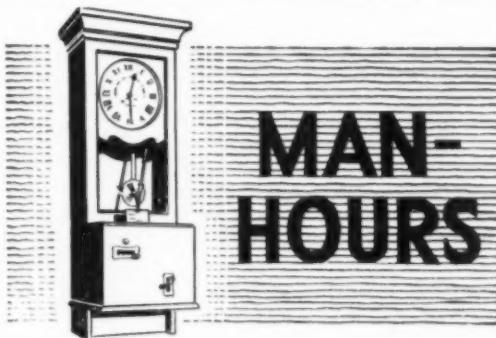
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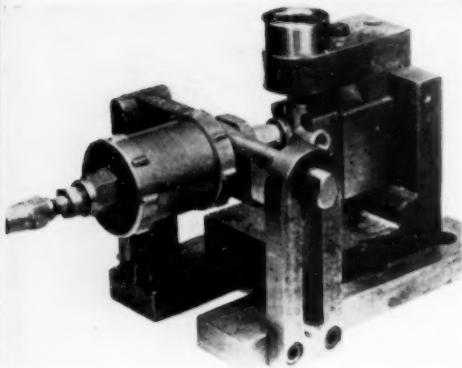
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Production costs are the sum of materials, overheads and man-hours . . . and the greatest of these is man-hours. Gledhill-Brook Recorders provide an accurate record of working time, and the relative statistics for an analysis of overtime and varying wage rates. The Gledhill-Brook System is essential equipment in every serious effort to improve production.

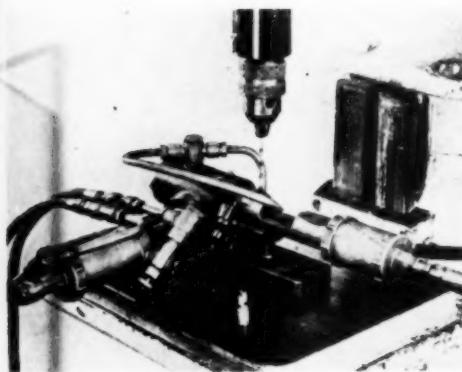
GLEDHILL-BROOK TIME RECORDERS AND COSTING SYSTEMS

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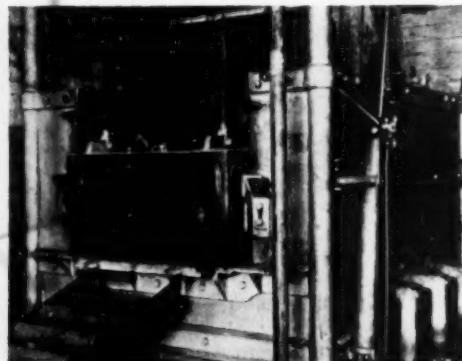
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38 EMPIRE WORKS - HUDDERSFIELD



A simple clamp for rapidly and accurately positioning a workpiece prior to drilling.



This two-position clamp automatically adjusts the workpiece to a second position after the first hole has been drilled.



Furnace doors operated by pneumatic cylinders.

How Compressed Air Can Lift Output

By N. P. WATTS*

"More power to your elbow" is the fundamental answer to the demand for higher output per manhour. Power comes in various forms; one that cannot be neglected is compressed air. Pneumatic equipment can make work easier, less tiring—and faster.

THE simplest way to get more output from a worker is to make his work easier, both in effort and skill. One way is to supply him with appliances that will do some of the work for him. These appliances may be operated by different types of power; one of these is compressed air. Pneumatic equipment is not the answer to all problems, but, properly used, it possesses many advantages. It is flexible, reliable, easy to apply and to use, and requires comparatively little capital investment.

There is a wide range of air cylinders, control valves and ancillary equipment on the market from which can be built up anything from a simple clamp to a complicated fully-automatic cycle of operations. Examples of applications are infinite; factories making products from candles to motor cars can use compressed air to increase production from 25 to 1,000 per cent. With such versatility, success depends on the insight of the man who conceives and designs the equipment.

Applications of air cylinders to jigs and fixtures for clamping are many. Most drilling fixtures need only a locating cylinder with a modest power output, but most milling fixtures require a good deal of thought to obtain the best results.

A simple drilling fixture is

utilized for drilling two holes in a round steel component at right-angles to each other and in different planes. To load, the component is merely dropped into a channel. A single-acting cylinder drives the component home against a locating face and clamps it into position. The first hole is then drilled. A double-acting cylinder then comes into play and operates a rack and pinion, revolving the whole jig body through 90 degrees. A spiral thread simultaneously moves the fixture forward so that the component is in the correct position for drilling the second hole. Two stops adjust the rack and pinion movement. When the clamping cylinder is exhausted the component is ejected from its guide bush by a spring-loaded plunger. A blast of air ejects it from the fixture and goes through the jig body to clear swarf and clean all locating faces. Loading and unloading time is thus reduced to a minimum.

A standard pneumatic vice with a toggle mechanism has been designed as a universal fixture for drilling and milling. A 3ins. bore cylinder is built-in, which generates a direct pressure of 500lb.; the maximum pressure available between the jaws is about 2 tons. Soft jaws can be machined to accept different workpieces. The pressure can be varied either by the adjustment of the toggles to a less efficient position, or, alternatively, by reducing the air pressure

* Condensed from a paper read to the London section of the Institution of Production Engineers.

applied. Once the vice has been adjusted to clamp the workpiece at the required pressure, the jaws can be set to move as little as necessary to load and unload the component, thus making it impossible for the operator to trap his fingers.

A mechanically-operated fixture can often be tightened to the extent of distorting a casting. An air-operated fixture can be set to operate at suitable pressures to avoid this.

In many plants, even more startling results have been obtained with air cylinders in the assembly shop than in the machine shop. One firm designed a fixture for testing assembled double-acting air valve bodies for correct assembling and porting. The two $\frac{1}{4}$ in. holes through the centre of the valve normally used for attaching it to the actuating mechanism are used as locating holes on two pegs in the base of the fixture.

A cylinder holds the valve in position while a piston seals and feeds air to the inlet port. Two other pistons seal and feed air from the outlet ports to two small test cylinders. By moving an operating lever forming part of the fixture the tester can easily judge if the valve is functioning correctly. The fitting and tightening of unions to the valve for test purposes are eliminated and much time is saved.

Save Air Cost

In the woodworking trade pneumatic equipment is employed for assembling and clamping a number of components of such things as door frames, window frames, radio cabinets, etc.

The ejection of components from presses and of swarf from machines by a blast of air is another fairly common use of compressed air. In many cases, however, the airline is left open all the time. The waste and cost of such a practice is enormous. A $\frac{1}{4}$ in. bore hole left open from an air supply at 100lb. per sq. in. will pass approximately 100 cu. ft. of free air per minute. To compress this volume requires about 25 h.p., the equivalent of 32 tons of coal a year. A few shillings spent on suitable valves and fittings will

How to Organize "Operation Airlift"

1. Choose initially applications that are simple and can be easily understood, not only by management but by workers.
2. Use standard equipment with which workers are familiar and for which servicing is readily available.
3. Design equipment so that pneumatic gear is accessible.
4. Maintain a small stock of spares for servicing and experiment.
5. Think of the operator's safety from the start.

save many pounds worth of horsepower annually.

A simple air cylinder can considerably relieve fatigue on a heavy drilling operation providing hand control is retained, especially for the final breaking through process, but in general, the task of feeding cutting tools should be left to hydraulic control.

The compressibility and sponginess of compressed air come into their own when an air cylinder is used as a hoist. No air is wasted by a cylinder hoist, as only sufficient enters the chamber to lift the weight attached. The operator can thus, with little physical effort, raise or lower the weight a few inches from the position where the hoist is suspending it, and this is useful when loading a machine.

One way of moving a heavy jig or piece of machinery along or revolving it round a flat surface is to float it along on a cushion of air. The heavy object is mounted on a flat baseplate, the underside of which has been relieved out to a depth of $\frac{1}{4}$ in. to within 1 in. of its outer edges. Air can be supplied to the chamber so formed through holes drilled for the purpose. Providing both the face of the table and baseplate are reasonably square and flat, a few pounds of air pressure will separate the weighty mass from the table and allow the fixture to be moved by the light pressure of one hand. Some leakage of air pressure is bound to occur, but as the pressure

used is usually under 5lb. per sq. in., the operating cost is negligible. A baseplate counterbored to an area of 3 sq. ft. will lift a weight of nearly 1 ton.

Much effort and time can be saved by installing a pneumatic cylinder for the lifting and lowering of doors of a furnace. The fitting of the cylinder and control valve is usually simple. Normal methods of operation can still be used if necessary.

Some manufacturers are now fitting pneumatic equipment for controlling clutches, as standard to their presses. This not only reduces operator fatigue, but also eliminates many complicated mechanical linkages and thus reduces the original cost of the machine.

Air Cylinder Control

Large control valves in feed pipelines, as installed in the chemical and allied trades, are now often controlled by air cylinders fitted to the valve. A number of valves spread over a large area can thereby be controlled from one central room. In such cases a pneumatic or electrical relay device in the control room shows whether the valve is actually open or closed, and guards against the possibility that a mechanical fault may have prevented the air cylinder from moving.

continued on next page

The timing of a number of cylinders required to move in a definite sequence may be carried out by various means. Valves may be fitted so that the operator may move them in a desired sequence. This leaves a good deal of responsibility to the operator, and he may go through the sequence too rapidly, but this system has the merit of simplicity and ease of maintenance.

Relay Valves

The more complicated, but safer, method is to employ relay valves opened in turn by the pistons as they arrive at the end of their stroke. The air supply is thus relayed to the next valve, which will move in turn. A variation of this method is the use of limit switches actuating solenoid-operated valves.

Various types of solenoid or air-operated remote-control valves are available, which can be operated either by limit switches or air valves to provide a mechanism whose cycle of movement can either be fully automatic or semi-automatic. The remote-control valve is useful when the cylinder to be actuated is a fair distance

Jobs Compressed Air Can Do

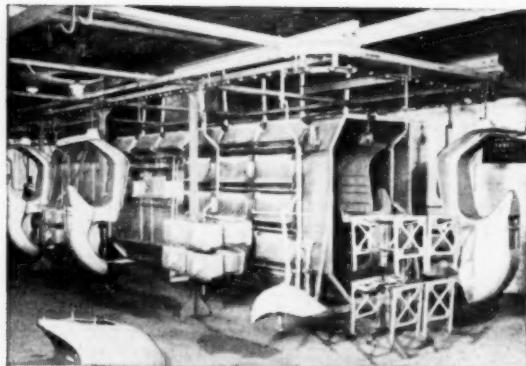
- Clamping and indexing mechanisms for transfer machines
- Operating chucks and tailstocks on machine tools
- Power units for small presses
- Spin riveting
- Diecasting
- General assembly work
- Mechanical movements of conveyors
- Doors or ploughs for controlling direction of flow on conveyors
- Operating reciprocating mechanisms in mixing plants, etc.
- Testing valves, tanks, etc., for leaks
- Clamping workpieces for spinning operations
- Opening factory doors and windows
- Remote control of clutches, reversing gear on marine engines etc.
- Operating laundry pressing machines
- Operating boot and shoe manufacturing machines
- Polishing processes.

from the operating point. Examples of this kind of application are to be found in the operation of hopper doors in road-making machines, quarrying hoppers, etc., where the control of the

air cylinder may be anything up to 150ft. to 200ft. away. The installation of these valves is usually more important where the operating cylinder is of a relatively high cubic capacity.

330% DRYING SPEED-UP

achieved by **DE LA RUE**
INFRA-RED PANELS



Stove-enamelling
the components of this motor-cycle takes only 9 minutes instead of the usual half-hour. The sprayed components are passed through a Gas-fired Infra-red Tunnel, consisting of 42 De La Rue (Potterton Type) process panels, by means of a mono-rail conveyor travelling at variable speeds. Even heat distribution to the underside of the curved one-piece chassis is ensured with six radiant panels fitted in the centre of the tunnel.

Similar production speed-ups may be achieved in your factory. For further information, write to :—

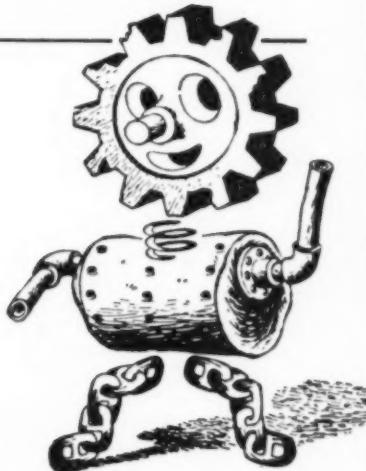
THOMAS DE LA RUE & CO. LTD. (Gas Division), IMPERIAL HOUSE, 84/86 REGENT STREET, LONDON, W.I

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NEW STEEL

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(MAY BE IN HIDING OR DISGUISED)



Bring your detective powers to bear on the search for scrap and you'll probably unearth tons of it disguised as old plant you never use or hidden in out of the way corners of your warehouses, stockrooms and yards.

The new steel every industry needs can be made from the old steel it has done with. Find all you can. Round it up. Turn it in.

Your scrap merchant will help with dismantling and collection.

Issued for the STEEL SCRAP DRIVE by the
British Iron and Steel Federation, Steel House, Tothill Street, London, S.W.1

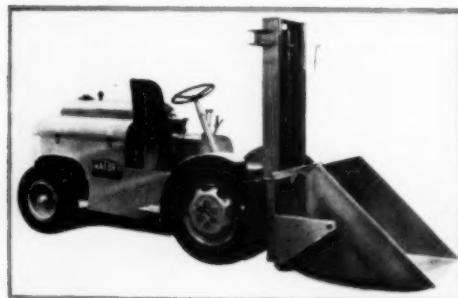
Speed the
SCRAP
Speed
the Steel

Survey of Modern
INDUSTRIAL EQUIPMENT

MECHANICAL HANDLING

Loose Load Truck

FORK lift trucks, although ideal for a variety of mechanical handling jobs in the factory, are



This bucket attachment for the Matbro truck handles coal, coke or rubbish.

unsuitable for use with loose, unpalletized loads, such as coal, coke or rubbish. A method of dealing with this type of work is to fit a bucket-shovel attachment. To be fully effective, this must be capable of rapid interchanging with the lifting forks, and the truck

must be capable of working over rough ground.

All these conditions are fulfilled by a new shovel unit available for the Matbro truck. Fitting the attachment takes only a few minutes, and the large pneumatic tyres of the Matbro make for stability even on the most uneven ground. The truck, when modified in this way, is particularly useful for moving fuel from dumps to hoppers, even over long distances. Capacity of the new shovel attachment is a cubic yard.

—Enquiry Ref. No. D.51/12.

Lowers Costs

THE sole motive power of the Aircush Lowerator is gravity, and it is completely automatic in operation. Normally used in conjunction with conveyors, it is designed for lowering crates, barrels, bales, etc., from one floor to a lower one.

Basic component of the unit is a cylinder tube that extends from level to level through an opening in the upper floor. A platform for the goods slides up and down on this tube and is counterbalanced by a piston inside it. When a load is placed on the platform it sinks under the weight; the piston rises up the tube, and

For Handier Handling —



**LAMSON
MOBILE
CONVEYORS**

You'll find that Lamson Mobiles are handy models to have around—handy for handling a hundred different jobs, handy for moving to the spot where they are most required. On

any loading or stacking job two men with a Lamson Mobile Conveyor can do the work of a whole team without. May we send you further details?

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Radiophone assures you of

a Merry Christmas and a Prosperous New Year



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If four
can do the work of five unequipped vehicles,
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Newcastle-upon-Tyne, 2.

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Business Radio (Scotland) Ltd.,
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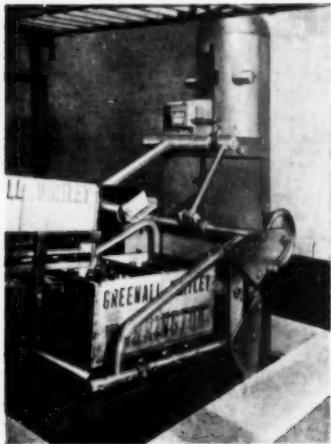
MIDLANDS & S. W. AREA
Pye Limited,
2-4 James Watt Street,
Birmingham, 4.

the air it displaces is forced out through a number of ports. As the platform nears the end of its drop, the piston passes the last of the ports, and the resulting compression of the air in the cylinder brings the platform to a gentle

stop. A tipping motion rolls the load forward off the platform, the heavy piston then falls in the cylinder, and the platform rises and comes to rest at the upper level with a repetition of the cushioned action. The rising platform operates a trigger which allows the next crate, etc., to roll forward off the conveyor, and the lowering cycle is repeated.

The rate of handling naturally depends on the drop required, but the *Lowerator* illustrated handles 400 cases an hour. This rate could be doubled by arranging for two cases at a time to be carried. An important attribute of the device is that it occupies only 8 sq. ft. of floor space.

—Enquiry Ref. No. D.51/13.



The gravity-driven Lowerator at work handling crates.

PACKAGING EQUIPMENT

Plastic Protection

CORROSION of the metal parts of machinery during transit, especially by sea to tropical countries, has often caused serious losses of time and money. A new plastic packing material, trade named *Liquid Envelope*, provides complete protection against mois-

ture and vapours for all machinery, equipment, etc.

The material is simply sprayed all over the machine to be protected, and it forms a tough skin that will last for many months. No preparation of the surface is



A machine embalmed in plastic.

required and only two coats, at intervals of 10 minutes, need be applied. Any thickness can be sprayed on, but .025in. is sufficient for most purposes.

Removal of the skin is simple; a slit is made with a knife and the

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SUITABLE**
for the smaller factory

M16 TIME RECORDER

- Super-fast automatic recording by simple one hand operation.
- Single or two colour printing.

We invite enquiries on any problem relating to the indicating, measuring or recording of time electrically.

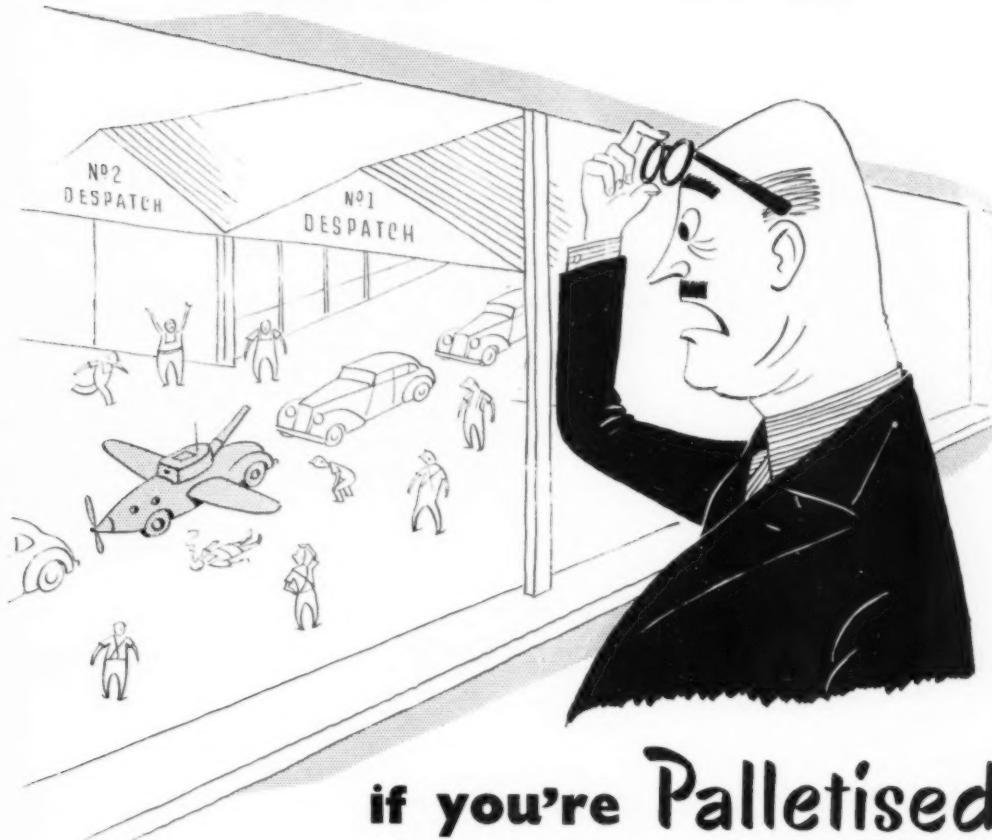
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ASHTead 866 (8 lines)
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Stores have become mobile. The production line depends upon supplies of materials and components at the right place at the right time and with the minimum of effort. Industry's answer is the fork lift truck and efficient palletisation.

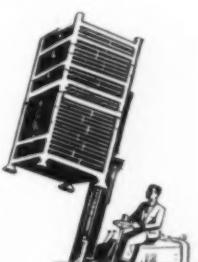
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WHITEGATE FACTORY, WREXHAM, N. WALES. Telephone: Wrexham 3566-8.

DECEMBER, 1951



rest of the envelope then peels off. So effective is the protection the material affords, that treated goods can be stored in the open for long periods or shipped as deck cargo.

Savings in freightage and storage charges and the elimination of damage from rust and corrosion should easily justify the extra expense involved in this method of packing.

—Enquiry Ref. No. D.51/14.

PROCESS EQUIPMENT

Free Feeding

SNATCHING" of material being fed is one of the greatest snags with coil feeds to pressing and stamping machines. The *Horizontal Stock Reel* is an ingenious device that uses the natural spring of the coil of metal to ensure an even feed. When used in conjunction with an automatic feed, the *Stock Reel* is loaded with a coil of material and the inside end of the coil is taken from the centre and threaded over guides to the feed mechanism. As the material is drawn forward, its natural spring turns the reel, allowing constant slackness.

Reels of metal up to 24ins. in diameter, 6ins. in width and 40lb. in weight can be accommodated on the *Stock Reel*; its efficiency is not affected by the weight of material on it.

—Enquiry Ref. No. D.51/15.

Heat Welding Plastics

WIDELY used in the packaging industry, *Polythene* plastic material has the disadvantage of being difficult to heat weld satisfactorily. The *H.S.16 Heat Sealer* has been specially designed to overcome this difficulty in the

manufacture of bags and envelopes from *Polythene* and other thermo-plastic materials.

The films to be joined are fed between the 16in. jaws of the sealer and a foot-operated switch applies heat for a predetermined time by means of electric impulses. The complete operation takes only two seconds, and even in the hands of an unskilled operator the sealer has an output of 1,200 welds per hour.

The width of the seam can be varied up to a maximum of $\frac{1}{4}$ in and the machine will handle material up to .008in. in thickness. The dimensions of the *H.S.16* are:



This machine enables Polythene to be satisfactorily heat welded.

Space Problem

B.E.V. High Lift Fork Trucks are extremely manoeuvrable and are able to stack above head height, this makes them invaluable wherever space is a problem.

We show a typical B.E.V. Truck at work in a Liverpool factory. If you have a handling or storage problem, our technical staff can advise you.

Photographs, courtesy of Belling & Lee Ltd.

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Electric Welding

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Your Electricity Board will be glad to help you to get the utmost value from the available power supply. They can advise you on ways to increase production by using Electricity to greater advantage — on methods which may save time and money, materials and coal, and help to reduce load shedding. Ask your Electricity Board for advice: it is at your disposal at any time.

Electricity for PRODUCTIVITY

Issued by the British Electrical Development Association

length, 16ins.; width, 18ins.; height, 10ins.; weight, 50lb.

A useful feature of the sealer is that welds can be made successfully through the liquid contents of filled containers.

—Enquiry Ref. No. D.51/16.

GAUGES & TOOLS

Torches for Craftsmen

THE Cutogen range of oxy-acetylene blowpipes includes models designed for general-purpose cutting and also for a variety of heavy-duty work. Special attention has been paid to the finish of the instruments, as the manufacturers maintain that this encourages operatives to take a pride in their work.

A stainless steel top tube carries the oxygen to the nozzle, and all other parts are chromium-plated.



The No. 5 torch is suitable for cutting up to 12ins. of steel and, with suitable attachments, it can be used for gouging, rivet-washing, piercing and powder cutting. This model may be either 18 or 24ins. long in standard sizes, but other lengths and special angle heads can be supplied if required; the weight is 4lb.

The No. 3 torch for heavy-duty work has a length of 27ins. and weighs approximately 5½lb. Up to 20ins. of steel or 15ins. of cast-iron can be handled by this torch.

All the Cutogen blowpipes have internally threaded heads for fitting the nozzles. This protects the threads from damage and ensures that they cannot become clogged with dirt or "spatter."

—Enquiry Ref. No. D.51/17.

GENERAL EQUIPMENT

One Piece Pan

THE handling and storage of small components, such as nuts and bolts, in bulk can be simplified by using tote pans. A

One of the new pressed steel tote pans.

new type now available has large handles that make lifting easy, and they can also be supported by rods in a storage rack.

The pans are a robust one-piece steel pressing, and provision is made for fitting identifying labels. Dimensions are 16ins. long and 8ins. wide.

—Enquiry Ref. No. D.51/18.

PAINTS & FINISHES

Alkali Resistant Paint

APPLYING paint to actively alkaline material, such as new cement or plaster, presents builders and decorators with many difficulties. Dampness often further aggravates the risk of failure with ordinary oil-bound finishes. Such interior surfaces can be successfully treated with Factron wall paint—a new product that can be applied, even to damp walls, without the need for neutralizers or sealers. The paint is available in a range of pastel shades and it gives a matt finish that is washable and will not flake. One gallon will cover between 700 and 800 sq. ft. of wall; two coats are sufficient for all ordinary purposes.

—Enquiry Ref. No. D.51/19.

THIS WORKSHOP CHANGED TO DE LA RUE RADIANT HEATING and benefited 4 ways

BENEFIT 1. The *De La Rue* panels radiate heat directly to the workers, without warming the intervening air.

BENEFIT 2. Open doors and windows cause no reduction in the radiant heat available.

BENEFIT 3. Greater comfort of workers has led to increased output and fewer complaints.

BENEFIT 4. No time is lost in the mornings waiting for the building to "warm up": adequate heat is supplied within a few minutes.

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Labour turnover tends to be lower in firms with pensions schemes; they attract a better class of worker.

**PENSIONS ARE ALSO
AN INCENTIVE**

Continued from page 43

determined in part by the salary he received in 1908. This has meant in practice that many funds have either been forced to pay out benefits that bore no relation to the increased cost of living, or to make up the benefits at the risk of insolvency. For this reason most modern funds are based on the "money purchase" system, whereby each single annual contribution purchases a definite amount of pension, according to the age of the employee when the contribution is paid and the age at which he will retire. It is thus possible to allow for any fall in the value of money by increasing the premium, with a consequent increase in benefit on the expiration of the policy. Such increases can be made at any time during the course of a policy. This does not, of course, diminish the effect of inflation, but it does at least spread its impact over the years.

The businessman who decides to launch a pension scheme has two alternatives; he can run his

Continued on page 90

FORGE A LINK OF LOYALTY

STAFF  FIRM

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This difficulty can be overcome

by converting your existing Synchronous Time Recorders to Spring-drive or to operate in a Bick Master Clock System.

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DECEMBER, 1951

own scheme, or he can go to one of the insurance companies specializing in this type of business and get them to do it for him. The pros and cons of these two alternatives are set out in the panel on page 43; but while for the large concern the question may be debatable, the smaller concern cannot do without the services of the companies. Just where the borderline comes is doubtful; the Association of Superannuation and Pension Funds tentatively suggests a fund with 100 members as a minimum for a private scheme.

Consult an Actuary

The launching of a scheme, however, will require expert handling, and any businessman contemplating such a step should consult an actuary before making any move.

The services offered by the insurance companies all start with the basic scheme, under which an employee, in return for contributions by his employer and himself during the term of his employment, receives a pension on retirement for the remainder of his life. The amounts of the contributions,

the amount of the pension, the age of retirement, are set out in a trust deed, and the funds are managed by a trust, consisting of representatives of management and employees, with the insurance company guaranteeing the payment of the pensions. The payments are made either under a "Deferred Annuity" scheme or a "Group Life Assurance" scheme. The main difference is that in the former case a pension is paid at monthly intervals during the lifetime of the pensioner, while in the latter the payment is a single lump sum.

Various additional or alternative benefits can be obtained for a slight increase in premiums. These include:—

Group life assurance.—If an employee dies before reaching retirement age, his estate receives a sum equal to about one year's salary. This is, in addition to the normal refund of all contributions he has made. It is also an addition to a normal deferred annuity scheme.

Group family income benefits.—Various schemes exist whereby the pension is paid not merely during the pensioner's lifetime, but

also to his widow during her lifetime.

Group endowment instalment basis.—Payments on the death of the assured are made monthly until the date at which the employee would have reached retiring age if he had lived.

"Top Hat" Schemes

"Top hat" schemes.—These are supplementary pension schemes for higher executives based on endowment assurance policies, to give a lump sum, free of tax, on retirement. They are subject to certain restrictions (e.g., an employee is not allowed to take more than 25 per cent. of all superannuation benefits in the form of a lump sum), but all premiums can be paid by the employer. These schemes are now being widely used to provide incentives for senior management.

"With Profits" basis.—One company is now offering a scheme under which, in return for slightly higher premiums, benefits are increased by a bonus payable from, and varying with, the profits of the insurance company.

PENSION SCHEMES

WITH PROFITS

A new development

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DECEMBER, 1951

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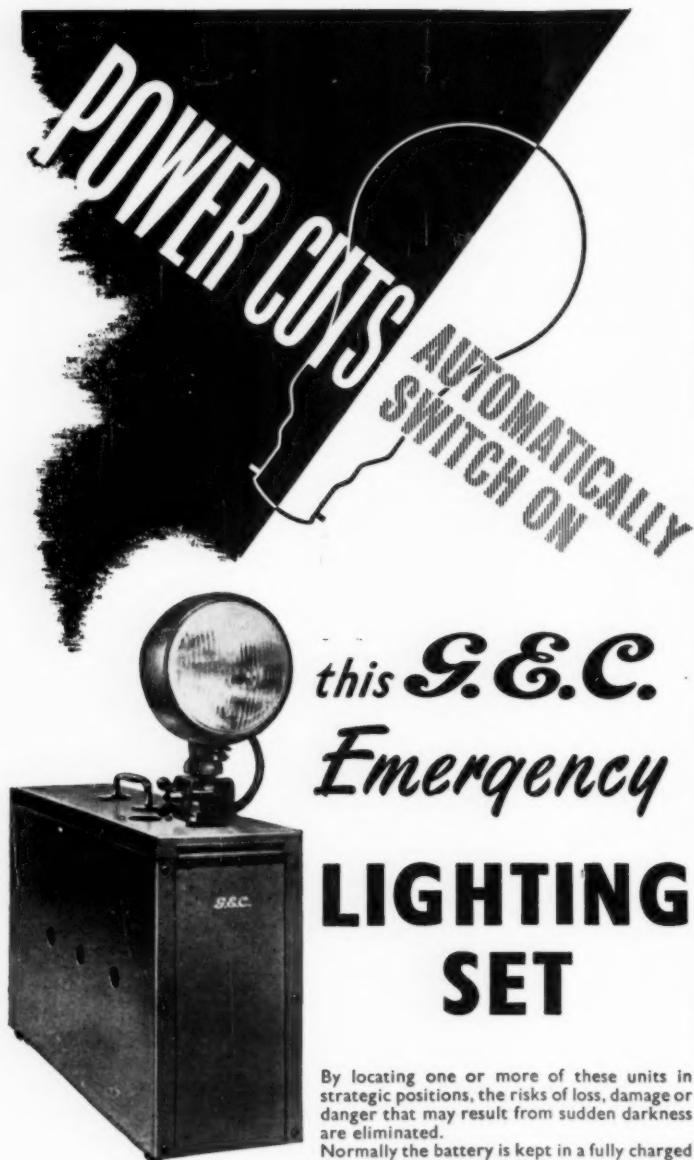
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Normally the battery is kept in a fully charged condition from the A.C. mains, through a built-in specially designed G.E.C. charger. When the mains input is interrupted a relay instantaneously switches on the powerful emergency lamps. Resumption of mains supply automatically switches the emergency lights off, and charging of the battery is resumed. The unit operates on 100/120v. or 200/250v. A.C. supplies of 40 to 100 cycles, and one or two 6 volt lamps may be operated from each unit up to a maximum of 60 watts.

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

Office Equipment Industry News

O.A.B.E.T.A.

Council Elected

IN addition to appointing a president and vice-president (see page 33), the annual general meeting of the Office Appliance and Business Equipment Trades Association elected the following members of council for 1951-2: G. C. H. Chubb (secretary, Chubb and Son's Lock and Safe Co., Ltd.); C. H. S. Cox (director, Percy Jones (Twinlock), Ltd.); J. A. Cumming (director, Gestetner, Ltd.); Frank R. Ford (managing director, Frank R. Ford, Ltd.); C. J. Mortimer (director, Leabank Chairs, Ltd.); E. C. Rylands (joint managing director, Carter-Parratt, Ltd.); A. W. Toy (manager, steel section, Roneo, Ltd.); M. G. Wright (managing director, Art Metal Construction Co.); W. B. Woods (past-president, director, National Cash Register Co., Ltd.); and Albert Cranfield (director, British Tabulating Machine Co., Ltd.).

The new association has no honorary treasurer and Mr. W. G. Gledhill therefore ceases to hold this office.



SIR William Palmer, K.B.E., independent Chairman of the Iron and Steel Consumers' Council, was guest of honour at the O.A.B.E.T.A. dinner at the Connaught Rooms, following the Association's annual general meeting on October 29.



MR. J. S. Skinner has recently been appointed Controller of Office Equipment Sales for the Remington Rand organization in this country. Mr. Skinner, who is a member of both the Incorporated Sales Managers' Association and the Institute of Industrial Administration, joined the company in May, 1928. Shortly after the outbreak of war, when Remington Rand was approached by H.M. Treasury to recommend someone

Continued on page 95

BUSINESS

NIFE BATTERIES

*repay their original cost
many times over*



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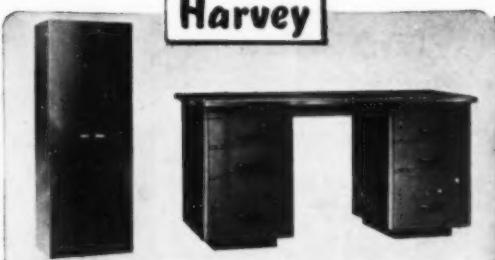


NIFE
STEEL BATTERIES

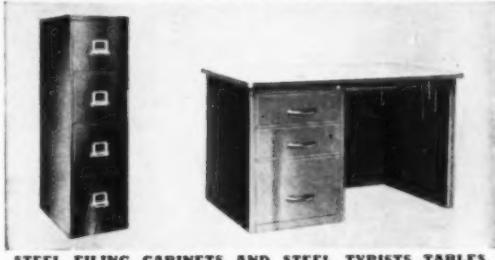
NIFE BATTERIES • REDDITCH • WORCESTERSHIRE

DECEMBER, 1951

Harvey



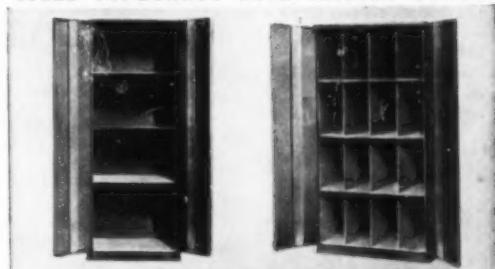
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BUSINESS

Office Equipment Industry News

for the post of Assistant Organization Manager, Mr. Skinner was chosen, later becoming Organization Officer.

After returning to Remington Rand at the end of the war, he



Mr. J. S. Skinner, who has recently been appointed the Controller of Office Equipment Sales at Remington Rand, Ltd.

became General Sales Manager of the Kardex Division, and in June, 1949, was appointed General Sales Manager of the newly-created Systems Division. He supervised the merging of the Office Equipment and Kardex Sales Divisions.



★
JAMES H. Randall and Son, Ltd., manufacturers of Randal-rak equipment, recently celebrated the centenary of the firm's foundation with a steamer trip on the Thames.

Before lunch, the party gathered round the deck to present Mr. J. E. Randall, chairman of the company, with a terra cotta bust of himself, subscribed by the firm and commissioned from Miss Freda Skinner. Mr. D. W. Baskett made the presentation and Mr. Randall then presented a silver bowl to Mr. W. T. W. (Bill) Goodenough in recognition of his 25 years' service with the firm.

At seven the same evening, the boat left again from Westminster, with a party of over 250 of Mr. Randall's friends on board.

DECEMBER, 1951



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HOW MOTION STUDY BOOSTED PRODUCTIVITY

Continued from page 4

fettling, for instance, programme were previously laid down arbitrarily by the engineer, and this led to confusion and lost time. A result of careful investigation, it was found that to fettle each machine at regular intervals, according to the amount of wool processed since the last fettling, would cause no loss in quality and would secure better organization of labour and machine time. A programme board was devised and introduced.

Similarly, in the supervision of machines, a scheme of fixed patrols was introduced to eliminate unnecessary walking by operatives and duplication of effort.

The results of all this reorganization are difficult to assess. Certain figures have been published by the Employers' Council, but these tell only half the story. Even this half, however, is impressive. In the re-organized drawing section at Whitehead's, for instance, output in September-November 1950, was 261,750lb., against 241,400lb. in the same period of 1948. But man-hours worked were less—8,541 against 9,980—so that output per man-hour was 30.6lb against 24.2lb., an increase of 26 per cent. Average earnings of workers, too, are up—by 13 per cent. In spinning, one operative is now minding six sides (53 spindles), though no further details have been given as to the increase in productivity that this has entailed.

In the woollen mill results have not been so spectacular, though the have still been worthwhile. Output of the scribbling department following the reorganization of lay-out and fettlers' and minders' duties, showed an increase of five to six per cent. with a reduced labour force. The yield per bale of material processed has increased by 3.5 per cent. since reorganization. Production of shoddy (waste) has been reduced by 4 per cent. Earnings, under a new incentive scheme, have increased by 11 per cent.

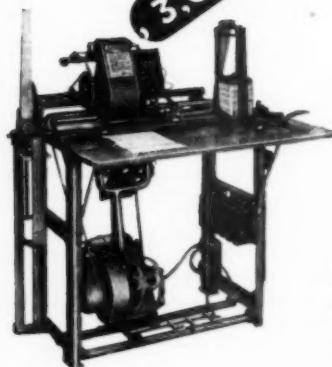
In all sections quality has not suffered as a result of the reorganization; indeed, the management's opinion is that it has improved.

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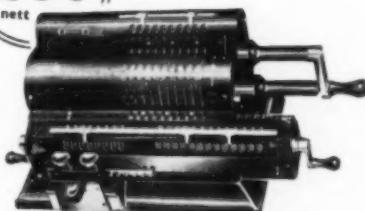
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No, Mr. Perks.

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Helping Workers to Pull their Weight Efficiently

By HAMISH ROBERTSON

Each time a worker bends down to pick up an article, he is lifting a large proportion of his own body weight. In this and other ways, energy is lost which can be better employed in useful work. The solution is for management to teach workers to use their own bodies efficiently—and provide the means for them to do so.

THE importance attached by management to the conservation of human energy is seen in the rapid post-war development of mechanical handling methods. There is, however, another side to the problem, and that is the question of teaching workers to use their own bodies efficiently—and giving them the facilities to do so.

Scientific investigation of weight lifting methods has shown: (1) how workers can help themselves and save energy by eliminating useless effort; (2) how management can introduce physical arrangements or methods which limit the loads to be lifted or lessen the strain involved. Of these two sets of conclusions, the more important are those involving management.

Factory workers commonly spend physical energy in about

four different ways: (a) lifting; (b) carrying and conveying; (c) pushing and other movements associated with "static effort"; and (d) stacking. The recommendations that follow have been grouped under these headings, some of them deriving from the Ergonomics Research Society's recent conference at Birmingham, and the Royal Sanitary Institute conference at Southport. More detailed references appear at the end of the article.

Lifting

There are two methods by which a load may be lifted from floor-level. One method is to bend the knees with slightly bent trunk, followed by extension of the knee joint to raise the load. This protects the muscles of the

Maximum load,
experienced
worker, 130lb.



Maximum load,
young worker,
35-60lb.



Maximum load,
woman worker,
50lb.



Load supported at
waist level is best.



back. Alternatively, the knees may be kept stiff and the back bent and straightened again, the strain of raising the load thus falling on the back muscles.

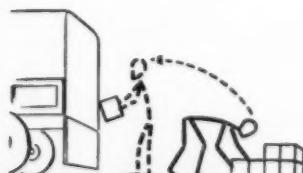
For light loads, unless they are being lifted at very frequent intervals, the back-bending method is probably the best. If the loads exceed 56lb., however, it is preferable from the standpoint of energy conservation to bend the knees. A further advantage of this method is that the risk of strain and accident is reduced.

It is impossible to formulate any precise conclusions regarding the maximum load which can be safely lifted, but some useful indications are afforded by research carried out by the Industrial Fatigue Research Board (now the Industrial Health Research Board).

For men, the maximum load for an experienced worker has been placed at 130lb. (compact load). In the case of young persons maximum loads ranging from 35lb. to 60lb. have been suggested, depending on the age and sex of the worker, and whether the work is continuous or intermittent.

The average healthy woman would not be strained in any way if the maximum were placed at 50lb.; a healthy and well-trained worker can exceed this by as much

A tremendous saving in human effort can be achieved by providing loading platforms.



as 20 per cent. provided the load is compact and easily handled.

Training in sound methods of weight lifting is particularly important. The same principles are generally applicable to both sexes, but in the case of women and girls great care must be taken to avoid sudden strain of the abdominal muscles.

Carrying and Conveying

Bad methods of carrying and conveying loads may lead to postural displacement, with loss of efficiency and, perhaps, injury to the worker. A good method of avoiding this kind of trouble was evolved centuries ago, and is still applied in the firebrick industry.

A load supported at the waist-level of the carrier is distributed through the hip girdle to the

An uninterrupted run between loading and unloading points saves energy.



thighs and legs; thus chest movements are unrestricted, and an un-deflected centre of gravity is maintained. Carriage on the head is also fundamentally sound, while the physiological cost of carrying on the shoulder is moderate.

A study of barrow pushing showed that starting and stopping are operations for which considerable expenditure of energy is required. In transporting loads by barrow, as in the brick industry, it is important that there should be an uninterrupted run between the loading point and the place where the bricks are to be stacked. One stoppage owing to a bad corner might cost the worker 30 per cent. more in effort per load.

When a worker performs the cycle of work 140 times or more per day, as in the case of a setter in the brick industry, unnecessary expenditure of energy resulting from stoppages would add materially to his fatigue. The design of the barrow is also important; so, too, is the arrangement of the load so that it is balanced with minimum weight on the arms during transit.

In general, the best pace for weight carrying will depend

largely on the size of the load, the distance to be traversed, the amount of repetition, and the physique, age and experience of the worker. In certain industries it might be worth while investigating whether the pace set by conveyor systems permits the most efficient rate of performance to be adopted.

Pushing

If a worker has lifted a load on to a truck or wagon, and has then to push it into position, another factor known as static muscular effort may be introduced. Static effort is the most fatiguing and wasteful form of exertion, and should be eliminated as far as possible. In this case it might be avoided by studying the loading arrangements and truck design.

Much static muscular work is involved in holding the body in a position which throws the centre of gravity outside the base of support. Even holding out an arm for any length of time, or bending forward and saving oneself from falling by the action of the back muscles, results in unnecessary fatigue. If this static muscular effort is maintained over a long

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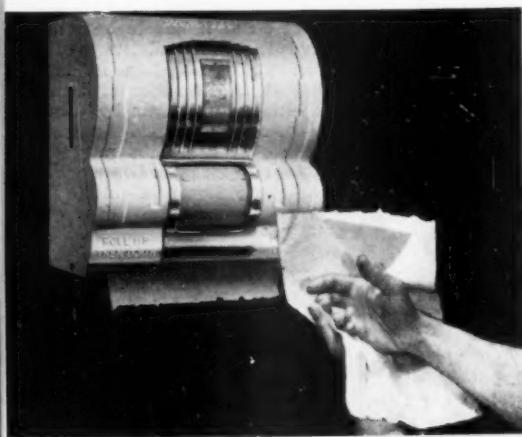
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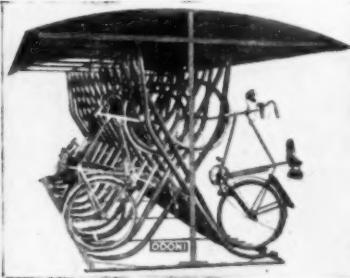
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period, the worker may begin to suffer from aches and pains.

Stacking

The problems associated with stacking are similar. Where materials are constantly being transferred from one level to another, a tremendous saving in human effort can be achieved by providing a loading platform. Where possible, initial stacking should be made at a height approximately level with the worker's hands, so that the man can grasp the object without having to bend his back and raise his own weight as well as the load.

If women and girls are employed on stacking, the work should be graduated until the abdominal muscles become accustomed to the work. At no time should loads be stacked to a height exceeding that of eye-level for men or breast-level for women and girls. This very necessary limitation can often be achieved by the use of steps, ramps or platforms.

So much for the recommendations attached to specific kinds of work. There are, however, three more of general application.

Loads should not be stacked (1) above eye level for men; (2) above breast level for women.



adequate margin of reserve energy is left. But it has to be remembered that the efficiency of the heart and circulation in individuals varies, and that until an unskilled worker learns by practice the co-ordinated and economical methods of using his muscles to the best advantage, the work will cost him more in static and dynamic effort and consequent fatigue.

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This Canteen Sets a New Standard in Design

By DAVID EARLY

Dingy dining rooms are poor appetizers. If workers are to get full value from their meals, it is in management's own interest to provide pleasant surroundings as well as modern kitchens.

IT is a commonplace of cooking that good food tastes even better if it is attractively presented. Meat and two veg. slopped up on a thick white plate can look revolting, but the same food neatly served on good crockery goes down twice as well and sends the customer away satisfied in mind as well as body—and since these two are usually inseparable, this is a worth-while achievement.

Oddly enough, it has taken quite a long time for the same idea to be applied to the catering establishment itself. Even today people who pose as *restaurateurs* open up dimly-lit, badly-ventilated premises with wobbly tables and tipsy chairs. Comes opening day, and hopeful diners push into crowded corners, take their meals at acute angles, pay their bills, and push out again—silent and sorrowful. Next day, they go somewhere else.

Unlike the city clerk, the canteen customer has no inhibitions about his place of eating. His standards may not always be of the highest, but if he does spot something he does not like, he gives immediate and forceful expression to the grievance—or simply withdraws his custom. This fact, plus a degree of enlightened self-interest on the part of management, has led to remarkably high standards in industrial catering establishments—so high that many canteens are a long way in advance of their commercial rivals.

A typical example is the new canteen at the Watford factory of Wild-Barfield Electric Furnaces.

Ltd. This establishment was deliberately planned with an eye to aesthetic values as well as considerations of comfort and efficiency. It is housed in a recently completed building, which also accommodates part of the stores, the first-aid room, production control, and the research and development departments.

The canteen and kitchen together form a rectangular block, 60ft. long by 40ft. wide. The kitchen is 20ft. square and is so sited that the canteen itself is in the shape of an L, the dimensions of the two sides being respectively 60ft. and 40ft. This shape has been adopted in order to facilitate social functions, since it allows the bar, refreshments and band to be located in the smaller section op-

posite the kitchen, so leaving an area 40ft. square available as the main hall.

An outstanding feature of the architectural arrangements is the system which has been adopted to give optimum lighting conditions. The building faces north and is parallel with the main works building, which it adjoins. The roof is of ordinary apex construction, with glass sheeting on either side. Natural lighting is admitted directly into the canteen through the glass on the southern side of the apex, while the glass on the northern side is so angled that light is reflected into the room from the glass sheeting on the roof of the taller works building immediately behind it.

In conjunction with the large

Above: colour photography is really needed for this picture. The ceiling is off-white, the walls are *eau de nil*, and the floor is a blend of maroon and burnt sienna.

Right: this modern steamer has three sections which can be used independently. The dome-shaped top is for cooking hams, etc.



proportion of window space on the southern wall, maximum daylight is admitted with a complete absence of glare. These conditions have been achieved by incorporating in the ceiling large sections of transparent plastic mesh. Fluorescent lighting will be mounted above this transparent material. Thus the canteen will have the advantage of both natural daylight and artificial light without the disadvantage of heat losses due to a tall roof.

The colour scheme has been chosen for brightness and cheerfulness. The ceiling is off-white, the walls are eau de nil, while the window frames and the woodwork are principally apple green. The floor is a blend of maroon and burnt sienna, and consists of composition tiles, which are easily replaceable should it be necessary to renew any areas which are subjected to particularly heavy traffic. The furniture is maroon. In order to enhance the atmosphere of homeliness, several reproductions of famous paintings have been provided by the management.

In the canteen kitchen a staff of six prepare over a hundred meals

a day. The kitchen has no ceiling, and this is popular with the staff. According to the manageress, most kitchens are too shut in, and it "makes all the difference in the world" to have plenty of light and air. The cooking equipment includes a large gas oven, a potato peeler and a very elaborate slicer. There is also a steamer of very modern design, so arranged that each of three sections can be independently opened and closed, while the dome-shaped top can be used for cooking hams, etc. A large refrigerator has been installed, and constant hot water is provided by a gas water heater.

How Meals are Served

The works staff are given their meals on the self-service system, a hot-plate with sliding doors being provided under the hatch. The office staff have self-service during the morning and afternoon breaks and are waited on at lunch-time. One of the reasons for building this very modern canteen was that the old premises had become too small for the increasing staff of both works and offices, and it was

necessary to have the luncheon and dinner breaks in three sessions. This resulted in a considerable loss of production, since it often happened that Smith was unable to get on with his job because Jones was having lunch in the canteen. Now that a larger canteen is available, it is intended to have two sessions only—one for the works and the other for office staff.

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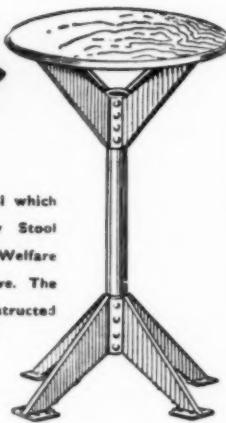
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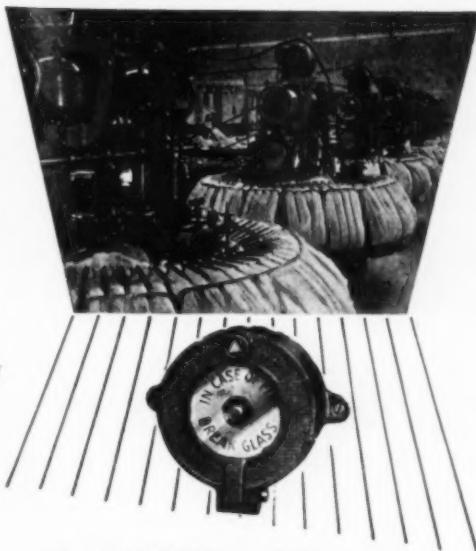
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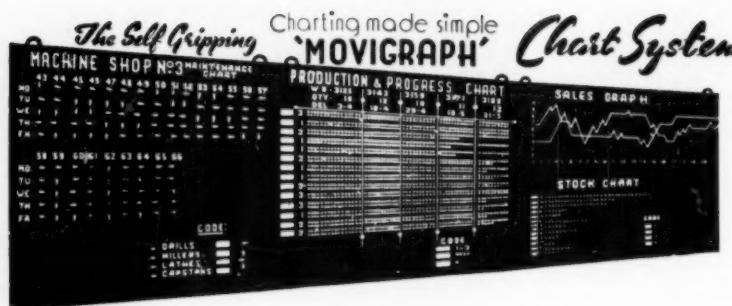
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—Enquiry Ref. No. S.12/2.

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they have a value which, if not immediately apparent, is none the less real.

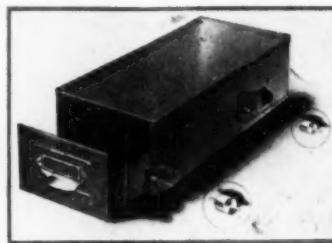
The standard size sheet is 17ins. wide by 13ins. deep. The coated strips run parallel to the 13 inch side, and their individual widths and the order of colours is as follows:—

(1)	(2)	(3)	(4)
Red	Black	Red	Black
2"	6½"	1½"	6½"

irreducible widths

= Total 17 inches.

The dimensions of the standard size sheet can be varied to meet a multitude of needs, either by increasing or decreasing the length (13ins.), or by decreasing the width (17ins.). The reduction in width can be achieved by decreasing either or both red (1) and



This cabinet has brass rollers.

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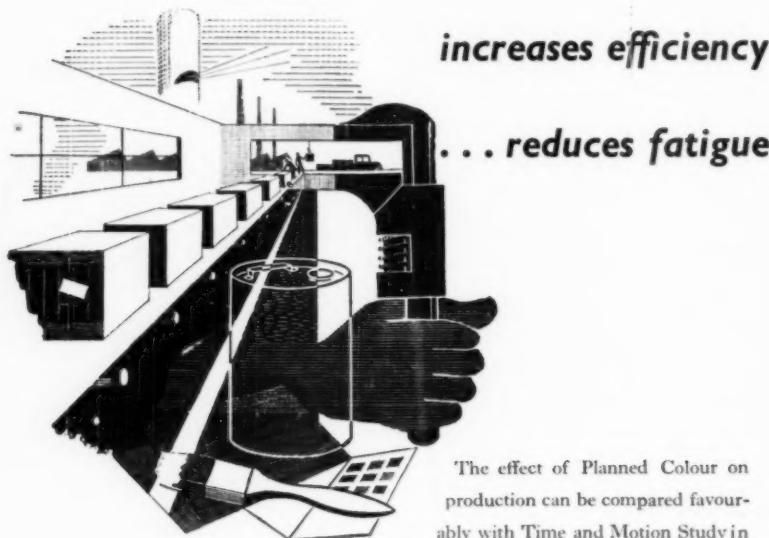
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